CITY COUNCIL
ZEPHYRHILLS, FLORIDA

Monday, February 26, 2024
6:00 PM

Please join the GoToMeeting
from your computer, tablet or smartphone:
https://meet.goto.com/763530541
or dial in using your phone:
+1 (872) 240-3412 - Access Code: 763-530-541
(Please mute your phone unless you wish to speak on a specific item)

Zephyrhills City Hall **Council Chambers**

Call to Order – Council President Lance A. Smith
Roll Call – City Clerk Lori Hillman
Invocation – Pastor Nick Deford First Church of the Nazarene
Pledge of Allegiance – Council President Lance A. Smith

1. MAYOR
    - 1.1 Pascal Collard Presentation - PTSD and Skydiving
    - 1.2 Sarah Vande Berg Tennis Center Pricing Presentation
        1. City presentation with pricing
    - 1.3 Water Use Permit Modification Update Presentation by Mike Clark - Jones Edmunds and Michelle Hayes - Liquid Solutions
        1. Council Presentation_02.26.2024
    - 1.4 Promotion of K9 Officer Sparkman to Sergeant.
        1. Professional Memorandum - Sparkman Promotion
2. CONSENT ITEMS
    - 2.1 Approval of February 12, 2024 Meeting Minutes
        1. M02-12-2024

2.2 Approval of February 20, 2024 Mayor's Caucus Minutes
   1. M02-20-2024 Mayor's Caucus

2.3 Award of Bid, Number ITB 2023-002, for N.E. Sewer Force Main and Water Main Phase 3 to US Water
   1. Exhibit A - ITB 2023-02(30378166.1)
   2. Exhibit B - ITB 2023-02(30378161.1)
   3. Exhibit C - ITB 2023-02(30378163.1)
   4. Exhibit D - ITB 2023-02(30378165.1)
   5. Exhibit E - ITB 2023-02(30378169.1)

2.4 Approval of Agreement No. 25-24-01 with US Water for the N.E. Sewer Force Main and Water Main
   1. 30376393v2 - Contract for Construction - US Water - Northside Water and Wastewater Force Main Phase 3 Project 25-24-01
   2. 25-24-01 Exhibit A Northside Water Force Main
   3. 25-24-01 Exhibit B Northside Water Force Main
   4. 25-24-01 Exhibit C Northside Water Force Main
   5. 25-24-01 Exhibit D Northside Water Force Main
   6. 25-24-01 Exhibit E Northside Water Force Main

2.5 Award Bid Number ITB 2023-03 for the South 301 Water and Sewer Improvement Project to US Water
   1. Exhibit A - ITB 2023-03(30378134.1)
   2. Exhibit B - ITB 2023-03(30378127.1)
   3. Exhibit C - ITB 2023-03(30378128.1)
   4. Exhibit D - ITB 2023-03(30378173.1)

2.6 Approval of Agreement No. 25-24-02 with US Water for the South 301 Water and Sewer Improvement Project
   1. 30377140v2 - Contract for Construction - US Water - South 301 W Water and Wastewater Pipeline Project 25-24-02
   2. 25-24-02 Exhibit A South US-301 Water and Wastewater Pipeline
   3. 25-24-02 Exhibit B South US-301 Water and Wastewater Pipeline
   4. 25-24-02 Exhibit C South US-301 Water and Wastewater Pipeline
   5. 25-24-02 Exhibit D South US-301 Water and Wastewater Pipeline

2.7 Approval of Task Assignment to RCM Utilities for Water Tower Valve Replacements
   1. Zephyrhills Valve Task Authorization
   2. Zephyrhills Water Tower Valve LERF

2.8 Approval of Task Assignment to RCM Utilities for Water Tower Motor and Pump Replacement
   1. Zephyrhills Task Authorization Pump and Motor
   2. Zephyrhills Pump & Motor LERF

2.9 Approval of Grant Administration Professional Services Agreement No. 37-24-02 - Audrey McGuire
   1. Grant Administration Professional Services Independent Contractor Agreement No. 37-24-02- Audrey McGuire

2.10 Canine Transfer of Ownership

1. Sparkman CANINE OWNERSHIP TRANSFER AGREEMENT

3. BUSINESS ITEMS/CITY ATTORNEY'S REPORT

3.1 Mayor's Youth Council Amendment
First Reading **ORDINANCE 1476-24 - "AN ORDINANCE BY THE CITY COUNCIL OF THE CITY OF ZEPHYRHILLS, FLORIDA AMENDING SECTION 30.140 OF THE CITY OF ZEPHYRHILLS CODE OF ORDINANCES, EXPANDING THE STUDENT SCHOOL GRADE LEVEL ELIGIBLE FOR APPOINTMENT TO THE MAYOR'S YOUTH COUNCIL; PROVIDING FOR APPLICABILITY, REPEALER, SEVERABILITY, INCLUSION IN THE CODE, AND PROVIDING AN EFFECTIVE DATE."**

1. Ordinance No. 1476-24 - EDITED COPY Mayor's Youth Council Amendment

3.2 Indoor and Outdoor Storage Facilities Moratorium Extension
First Reading **ORDINANCE NO. 1477-24 - "AN ORDINANCE OF THE CITY OF ZEPHYRHILLS, FLORIDA, AMENDING ORDINANCE 1455-23, TO EXTEND THE TEMPORARY MORATORIUM ON RECEIVING AND PROCESSING PLANS AND PERMIT APPLICATIONS FOR RECREATIONAL VEHICLE STORAGE MATERIAL LAYDOWN AREAS AND INDOOR STORAGE FACILITIES; PROVIDING FOR CONFLICTS, SEVERABILITY, EXPIRATION AND AN EFFECTIVE DATE."**

1. 30386751v1 - Ordinance 1477-24 Storage Facilities Moratorium Extension

3.3 Oakside Cemetery Amendment
First Reading **ORDINANCE 1478-24 - "AN ORDINANCE BY THE CITY COUNCIL OF THE CITY OF ZEPHYRHILLS, FLORIDA AMENDING SECTION 94.06. – INSTALLATION, MARKERS, MONUMENTS OF THE CITY OF ZEPHYRHILLS CODE OF ORDINANCES, AMENDING THE MARKERS REQUIREMENTS IN BLOCKS ONE THROUGH 8 (THE OLD SECTION) OF THE CITY OF ZEPHYRHILLS OAKSIDE CEMETERY; PROVIDING FOR APPLICABILITY, REPEALER, SEVERABILITY, INCLUSION IN THE CODE, AND PROVIDING AN EFFECTIVE DATE. "**

1. Ordinance No. 1478-24 - Oakside Cemetery Amendment

4. CITIZEN COMMENTS

MAYOR ANNOUNCEMENTS

CITY MANAGER ANNOUNCEMENTS

CITY ATTORNEY ANNOUNCEMENTS

CITY COUNCIL COMMENTS

ADJOURN

*** PLEASE NOTE: This is a Public Meeting. Should any interested party seek to appeal any decisionmade by the Council with respect to any matter considered at such meeting or hearing, he or she will need a record of the proceedings, and that, for such purpose, he or she may need to ensure that a verbatim record of the proceeding is made, which record includes the testimony and evidence upon which the appeal is to be based. F.S. 286.0105. If you are a person with a disability which requires reasonable accommodation in order to**

participate in this meeting, please contact the City Clerk at 813/780-0000 at least 48 hours prior to the public hearing. A.D.A. and F.S. 286.26.

SARAH VANDE BERG

TENNIS + SPORTS CENTER | WELLNESS CENTER | BOARDING

Business Update

Performance review and future of SVB



Zephyrhills
jump right in



Where we are after 3 years

SVB: *a place the public can call home, where athletes are formed, and excellence is served*

- Thriving sports programs (players from 43 different countries have visited the center)
- International tournaments offering local, regional, national and international visibility
- Boarding program (as well as short - and long term rentals) create significant economical impact to local economy
- The City of Zephyrhills highlighted during live TV, streaming and YouTube events (100 million viewers for Padel League, 250k viewers for tennis tournament, 1,000 visitors for Florida Senior Games Opening Ceremony, tennis and pickleball event, etc...)
- Employment opportunities (90% of SVB's workforce lives in Zephyrhills, Wesley Chapel and Dade City)
- SVB's generous donations to local charities contributes equally to the local economy

Goal 1
Tennis Academy

67% complete
(not enough boarders)

Goal 2
Membership close to 500

35% complete
(stigma believing SVB is private)

Goal 3
Wellness and Restaurant

35% complete
To generate additional foot traffic and revenue

4.6 out of 5

customers are satisfied
with our services
Google reviews

100 million viewers (CBS Sposrts)

Padel League Finals with VIP guest Daddy Yankee

4 national and international champions





Suggested New Rates

- **Tennis membership***

Old rate $80/month **New rate: $100/month**

*(20% off for Zhills members and no initiation fee)

- **Pickleball membership***

Old rate $50/month **New rate: $62.50/month**

*(20% off for Zhills members and no initiation fee)

- **Padel membership***

Old rate $80/month **New rate: $100/month**

*(20% off for Zhills members and no initiation fee)

- **Guest fee:**

Old rate $15/h (tennis and padel) - 90 minutes
New rate: $25/h (tennis and padel) - 90 minutes

Old rate: $5/h (pickleball)
New rate: 20$/h (pickleball)

$40 facility access fee for Silver Sneaker/Medicare members

All other rules and regulations maintained

Our Future Goals



Daddy Yankee and Marcos del Pilar at SVB

- Consolidate existing academy players and recruit additional international players
- Bring national and international events to Zephyrhills to further enhance the visibility for everything the city has to offer
- Recruit and retain members to create a vibrant social atmosphere which in return generates additional foot traffic
- Create social events associated with sports, such as Tennis round robins, padel-margarita, pickleball-DUPR nights, multisport and destination camps, etc...
- Hire marketing and social media handler to generate right messaging and help with recruiting
- Organize further multisport events including all 3 racquet sports
- Generate new programming once indoor facility is built
- Associate ourselves with partner for Wellness (again: foot traffic and visibility)

MAINTAIN THE EXTRAORDINARY QUALITY OF ALL OUR SERVICES

WUP Modification Request

- February 2023 – Preapplication meeting to discuss permit modification.
- April 28, 2023 – Modification request submitted.
- June 15, 2023 – RAI No. 1 Issued.
  - Quantity confirmation
  - Additional groundwater modeling.
  - Residential development information.
  - EMP Site Visit.
  - Restructured Water Conservation.

WUP Modification Request

- September 13, 2023 – Submitted time extension request.
  - October 26, 2023 - District completed site visit to EMP-1.
- November 10, 2023 – Response to RAI No. 1 submitted.
- December 13, 2023 – RAI No. 2 Issued.
  - February 19, 2024 – Meeting with District to discuss draft response.
    - Confirmation of groundwater model and well location
    - Draft agreement with well owners (being reviewed).
    - Requests additional EMP sites and use of District Wetland Assessment Procedure (WAP)
    - Geospatial analysis of development population

WUP Modification Request

- Timeline for residential developments
- Information on industrial/commercial water use
- Additional updates to the water conservation plan.

- March 12, 2024 – Response to RAI No. 2 due.

ZEPHYRHILLS POLICE DEPARTMENT
MEMORANDUM

To: All Personnel

Cc: William Poe, City Manager

From: Derek Brewer, Chief of Police

Date: February 16, 2024

Subject: Promotion Announcement - K-9 Officer Morris Sparkman

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I am pleased to announce the promotion of K-9 Officer Morris Sparkman to the rank of Sergeant, effective February 18, 2024. This promotion reflects Officer Sparkman's dedication, exemplary service, and leadership within our department.

Since Officer Sparkman joined our team, he has consistently demonstrated a commitment to maintaining the highest standards of professionalism.

As Sergeant, Officer Sparkman will take on increased responsibilities in supervisory roles, mentoring junior officers, and contributing to the strategic planning and decision-making processes within our department. We have full confidence that he will excel in this new role and continue to make significant contributions to the success of our law enforcement efforts.

Please join me in congratulating Sergeant Morris Sparkman on his well-deserved promotion. We look forward to witnessing his continued success and positive impact on our team.

REGULAR COUNCIL MEETING

A Regular Council Meeting was held on February 12, 2024 at 6:00 p.m. in the Council Chambers of City Hall and via GoToMeeting (872)-240-3212 - Access Code: 701-535-149.

Council President Lance Smith called the meeting to order at 6:00 p.m. Roll call was taken. Present were members Lance A. Smith, Charles Proctor, Kenneth Burgess, Jodi Wilkeson, Steven F. Spina, Ph.D., and Mayor Melonie Bahr Monson. City Manager William Poe was present. City Attorney Matthew Maggard arrived at 6:12 p.m.

Staff present: Police Lieutenant Nathan Gardner, Police Lieutenant Matthew Hillen, Public Works Director Shane LeBlanc, Planning Director Todd Vande Berg, Utility Director John Bostic, IT Director Michael Panak, Public Information Officer Kevin Weiss, CRA Director Gail Hamilton, Building Official Bill Burgess, Airport Manager Nathan Coleman, Water Superintendent C.J. Funnell, Principal Planner Rodney Corriveau, Water Treatment Plant Operator Eric Martin and City Clerk Lori Hillman.

Principal Planner Rodney Corriveau delivered the invocation. The Pledge of Allegiance followed. Mayor Melonie Bahr Monson asked everyone to keep the son of past Councilman Alan Knight, Joey Knight, in their prayers as he battles health issues. She sent wishes to the family to find strength during this difficult time.

1. MAYOR

1.1 American Water Works Association (AWWA) Florida Section Best Tasting Drinking Water Award

State Chair of the Florida Section of the American Water Works Association Marjorie Craig congratulated the City of Zephyrhills for bringing home the regional and state trophies for the best tasting tap water.

Utility Director John Bostic said staff will travel to Anaheim, CA to compete nationally at the American Water Works Association ACE conference June 10, 2024. He acknowledged the dedication of the City's water operators.

1.2 Award Winners of Photo Contest

CRA Director Gail Hamilton announced the top three winners beginning with 1st Place, Raymond Lester Adams - $300 (Skydivers), 2nd Place, Pasco County Public Transportation - $200 (Clock Plaza in Downtown Zephyrhills), and 3rd Place, Michael Claudy - $100 (Ducks in Zephyr Park). The winning photo will be submitted to the Florida County City Managers Association (FCCMA) for an opportunity to appear on the front cover of the (FCCMA's) Magazine through voting. A link to voting will be available on the City's website.

2. CONSENT ITEMS

2.1 Approval of January 22, 2024 Meeting Minutes
2.2 Approval of January 8, 2024 Meeting Minutes
2.3 Approval of December 11, 2023 Density Workshop Minutes
2.4 Approval of December 11, 2023 Meeting Minutes
2.5 Approval of November 27, 2023 Density Workshop Minutes
2.6 Vortex Task Assignment for Lining of 15,000 Feet of Gravity Sewer Mains
2.7 Appointment of Robert Page to the Airport Authority Board
2.8 Approval of Task Assignment's with Jones Edmunds for the Water, Wastewater, and Reclaim Water Master Plans and Updates
2.9 Duke Energy Electric Vehicle (EV) Agreement No. 41-24-02

Steve Spina moved to approve all Consent Items. Seconded by Jodi Wilkeson. Motion passed unanimously.

3. UNFINISHED BUSINESS ITEMS/PUBLIC HEARING

3.1 Text Amendment to Turning Lane Standards

First Reading **ORDINANCE NO. 1474-24 - "AN ORDINANCE OF THE CITY OF ZEPHYRHILLS, FLORIDA, AMENDING THE CITY OF ZEPHYRHILLS CODE OF ORDINANCES SECTION 150.01; AND AMENDING TABLE 1 OF SECTION 7.003.01 (SECTION 1) AMENDING THE EXISTING DE MINIMUS AND**

TRAFFIC IMPACT ANALYSIS TRAFFIC STUDY REQUIREMENTS AND (SECTION 10) AMENDING THE TRANSPORTATION MITIGATION (TURN LANE CRITERIA) AND ROADWAY AND INTERSECTION IMPROVEMENTS CRITERIA; PROVIDING FOR REPEALER, CODIFICATION AND AN EFFECTIVE DATE."

City Attorney Matthew Maggard stated in reviewing Ordinance No. 1474-24, two sections of the Land Development Code (LDC) were specifically addressed for amendments to avoid contradictory sections. He requested Council pull this item from the agenda to allow staff additional time and the opportunity to amend the appropriate sections within the LDC.

Jodi Wilkeson moved to remove Business Item 3.1 Text Amendment to Turning Lane Standards from the agenda. Seconded by Charles Proctor. Motion passed unanimously.

4. BUSINESS ITEMS/PUBLIC HEARING

4.1 Amend R4 Zoning Density from 20 units per acre to 14 units per acre

Second Reading **ORDINANCE NO. 1475-24 - "AN ORDINANCE OF THE CITY OF ZEPHYRHILLS, FLORIDA, AMENDING THE CITY OF ZEPHYRHILLS CODE OF ORDINANCES SECTION 150.01; AND AMENDING SUB-SECTIONS: 2.01.03.06 AMENDING THE MAXIMUM DENSITY IN MULTI-FAMILY RESIDENTIAL (R-4) ZONING FROM 20 TO 14 UNITS PER ACRE; AND TABLE 7.01.01 (DENSITY, AREA, HEIGHT AND BULK REQUIREMENTS) MULTI-FAMILY RESIDENTIAL (R-4) MAXIMUM DENSITY FROM 20 TO 14 UNITS PER ACRE; PROVIDING FOR REPEALER, CODIFICATION AND AN EFFECTIVE DATE."**

City Attorney Matthew Maggard read Ordinance No. 1475-24 by title. Council President Smith said this ordinance reduces the R4 zoning density from 20 units per acre to 14.

Planning Director Todd Vande Berg said staff is not prohibited from rezoning a piece of property PUD but would not circumvent the straight zoning of R4 and the intent of this ordinance. He said there are two Planned Unit Development (PUD) projects that have submitted preliminary master plans addressing density; Gateway and Eiland and Fort King. He said AdventHealth submitted an application without a site plan, prior to the moratorium, that is in Q. He referred to Abbott Square on Simmons Road as an example of a traditional PUD with a mix of single family, villas and townhomes with a small amount of 40’ wide lots.

City Attorney Matthew Maggard said a pending PUD without an approved site plan will come before Council with the density determined at their discretion.

City Manager William Poe referred to a listing he distributed to Council of eleven (11) R4 projects in Q depicted on a map with a proposed number of units.

A public hearing was held and there were no comments from the floor.

Steve Spina moved to approve Ordinance No. 1475-24 on the Second Reading. Seconded by Charles Proctor. Motion passed unanimously.

5. CITY MANAGER’S REPORT

5.1 Chamber of Commerce Grant Agreement No. 41-24-04

City Manager William Poe said the City has collaborated with the Zephyrhills Chamber of Commerce on economic development issues and strategies for a number of years and highlighted the proposed three year agreement’s scope of work encompassing short and long-term goals. Staff recommended approval of Chamber of Commerce Agreement No. 41-24-04 for the Zephyrhills Economic Development Coalition.

A conversation ensued around what is happening in local schools that is not reflected in the schools’ grades. Zephyrhills High School produced three (3) state legislators; Randy Maggard, Danny Burgess, and Tommy Gregory. The 2024 Teacher of the Year for the entire district was from Zephyrhills High School, Leanne Johns. There are success stories with good things happening in Zephyrhills.

Spoke from the floor: Chairman of the Board Randy Stovall – Zephyrhills Chamber of Commerce and Zephyrhills Economic Development Coalition

Dr. Stovall said a concerted effort was made to add a section on schools to the ZEDC's marketing webpage, Clearly Zephyrhills. The next step will be the addition of trade schools, specifically Kirkland Ranch Academy. He said Kirkland Ranch Academy will be hosting a Job Fair in April with an opportunity for the City of Zephyrhills to participate. He is hopeful local recruitment for employees with the expansion of Professional Hair Labs and the addition of Bauducco Foods will provide motivation for people to stay in the area. ZEDC is currently working with AMSKILLS on an economically viable partnership for recruitment in manufacturing jobs.

Councilman Spina requested the economic branch of the chamber stay uniquely Zephyrhills when the merger with the Dade City Chamber occurs in the summer of 2024.

Kenneth Burgess moved to approve the Chamber of Commerce Grant Agreement No. 41-24-04. Seconded by Jodi Wilkeson. Motion passed unanimously.

5.2 Update on Transportation, Park, Public Safety Impact Fees and Water Use Permit

City Manager William Poe provided an update on the transportation, park, and public safety impact fees. He said the transportation portion of the fees is lower than what is currently charged and a meeting has been scheduled on February 16th to discuss. He presented an update on the modification to the City's water use permit stating a meeting is scheduled for February 19, 2024 between staff and SWFWMD to clarify SWFWMD's request for additional information (RAI) prior to the City's formal submittal.

A discussion ensued regarding lengthy response times to the water use permit modification. Concerns were voiced to hold consultants accountable for the City's looming moratorium deadline and Council's expectations. There was a consensus among Council to invite consultants to the next meeting to present an update. A suggestion was proposed to host a workshop to explain in detail the entire optics of permitting and how it impacts the City.

City Manager William Poe said staff have discussed purchasing capacity from owners of agriculture wells as additional wells will not be permitted within the Hillsborough River Basin. He stated the City is not running out of water, the City is running out of cheap water options. The capacity requested through the modified water use permit covers residential development with additional capacity for industrial use and commercial development. If the City continues providing water within the Utility Service Area, other options for capacity need to be explored.

Spoke from the floor: Utility Director John Bostic – City of Zephyrhills

Mr. Bostic addressed the timing of consultant Jones Edmunds' work stating there is a large amount of information collected from the City and SWFWMD that has to be assimilated and reviewed for accuracy.

6. CITY ATTORNEY'S REPORT

6.1 Forest Lake Estates Expansion Utility Service Agreement No. 41-24-03 – Equity Lifestyles/Frontier

City Attorney Matthew Maggard provided a brief synopsis of this property stating utility service discussions began in 2019. A modification to the agreement was made, subsequent to the moratorium, to add language that if the developer prepays 50% of the connection fees, the City will reserve water capacity for five years. If the utilities are constructed to City specifications, and the Utility Department certifies the utility system has been built to City standards, the system will be turned over to the City to provide water and wastewater services. He reminded Council of their decision to approve projects in the works prior to the moratorium, and said this project was in the works and has been included in the modified water use permit.

Spoke from the floor: Attorney Clarke Hobby, Applicant's Representative – Hobby and Hobby PA – 109 N. Brush Street – Tampa, Florida

Attorney Hobby said this project has been in Q for two plus years and is on Jones Edmunds' tracking chart. He said the delay on the project's permitting stems from working with Pasco County on CR-54 permitting and drainage issues.

Kenneth Burgess moved to approve Utility Service Agreement No. 41-24-03. Seconded by Steve Spina. Motion passed, 4-1 opposed Charles Proctor.

7. **DEPARTMENT UPDATE**

7.1 Utility Department Update John Bostic

Utility Director John Bostic presented a list of Utility Projects greater than $100,000, costs associated with the department that have increased two-fold over the past five years, personnel costs, and operational costs. The department contributes $1M annually to the general fund. He said the Wastewater treatment facility has been staffed by two (2) out of five (5) state certified operators needed since August 2022. Since the end of 2019, the WWTP has not been fully staffed and has the potential of becoming a huge problem. He said the last salary survey brought operators up to the area standard in pay. He said he requested and received a reduction in staffing when submitting the last permit renewal from 7 days a week, 16 hours a day to 7 days a week, 12 hours a day. Currently, a salaried employee supplements time to cover employees who call in sick and schedule vacation. A SCADA and Chief Operator position have been open for over a year with no viable applicants applying. The wastewater collection system, water treatment division, and distribution center employees have all taken on a larger service area with additional duties and their time is stretched. As of July 1, 2023, Utility Department employees are classified as First Responders per Florida Statute 403.865. If there is major disaster, hurricane, etc. these employees will be working as essential employees. The Utility Department employees are a great group of people who work every day without recognition.

A conversation ensued around employee qualifications, certifications, cross over skills, on the job training, competitive salary and benefits, and the need to include municipal positions at local Job Fairs.

8. **CITIZEN COMMENTS**

Spoke from the floor: Kim Earle – 37741 Phelps Road – Zephyrhills, FL

Ms. Earle provided an update to Council on Trotter's Crossing stating she had her water tested and the levels have all risen and was advised to purchase a water filtration system. She said her attorney sent a letter to AMI developers addressing needed repairs and the construction of a swale to divert water that is continuing to drain through the back of her property and she received an 11 page settlement to sign. She said her neighbor's to the east have received an 8' fence paid for by the developer and is not sure why since they received no property damage. She said Joe with AMI told Council that the buildings would go vertical in January, this is February, and they haven't poured a footer or foundation.

City Manager William Poe said Mr. Earle's neighbors to the east negotiated with the developer as part of the rezoning of the property prior to construction. He said the planning department is currently in the process of reviewing the plat for Trotter's Crossing which has to be approved before they can go vertical.

City Attorney Matthew Maggard said water issues fall under the jurisdiction of the Southwest Florida Water Management District (SWFWMD). SWFWMD is fine with the construction and design of mitigation for water leaving the property. He said negotiations between AMI and Ms. Earle are private and the City does not have an opinion.

Spoke from the floor: Building Official Bill Burgess – City of Zephyrhills

Mr. Burgess said typically the silt is cleaned out of the pond at the end of the project to enable the pond to operate as designed. He said 25% of the water will drain around the property (historic flow) and the engineer will sign off on the stormwater upon completion.

Spoke from the floor: CEO Chamber of Commerce Vicki Wiggins – 38550 5th Avenue – Zephyrhills, FL

Ms. Wiggins thanked Council for their support of the Pigz in Z'hills and the approval of the ZEDC agreement. She congratulated Councilman Proctor for his win in the hog calling contest. Councilman Proctor challenged Vicki Wiggins to a hog calling contest next year.

MAYOR ANNOUNCEMENTS – Mayor Melonie Bahr Monson acknowledged the police department staff and Lieutenant Hillen and Lieutenant Gardner personally for their recognition and respect for Sergeant Dixon. She said the honor guard representation was touching. She thanked the judges of the Kids Grilling Competition, Public Works Department for the event cleanup and the police department for being on site to ensure safety.

CITY MANAGER ANNOUNCEMENTS – City Manager William Poe thanked City personnel for their assistance with the BBQ & Blues event and reminded those in attendance of the renaming of Ellis Harrold Park on Wednesday, February 14, 2024 at 12:15 p.m. There was a consensus among Council to hold a Mayor's Caucus on Tuesday, February 20, 2024, 5:30 p.m. to accept candidate petitions. Mr. Poe distributed four renderings and a floor plan dimension for the Sarah Vande Berg Indoor Tennis Center. He provided a brief history stating the design has changed three or four different times and the contractor has cost priced the project several different times. He said a block building cannot be built and no one wants a dome building so a pre-engineered metal building will be purchased. He referred to the two additional courts and said a bid alternate would be prepared for the court only surface to be paved, another bid alternate would be prepared for the court to be covered, and another bid alternate would be prepared for four additional hard courts to be placed on the northern side of the complex.

A conversation ensued around the orientation of the building in relation to Simmons Road, the height of the building, preservation of existing trees, time and money constraints, lack of parking, building facade, building location, removal of four tennis courts, cost of metal building, design the building to add a facade at a later date, estimated cost based on rendering, square footage and the possibility of approving something that could have unintended circumstances.

Spoke from the Floor: Public Works Director Shane LeBlanc – City of Zephyrhills

Mr. LeBlanc said the City has received a one year extension from the state to complete the indoor tennis center and said the City is working one year behind. He said the pre-engineered metal building has a long lead-time of about six months from the time the building is ordered which increases the time-line. He said if the site is moved, the stormwater will have to be assessed by a Civil Engineer because the site, where the four future courts are slated, is part of SWFWMD's permit for impervious surface. He added the building pad was also built up will fill instead of being exported.

City Manager William Poe recommended Council place the building on the piece of land negotiated with the Lovinger Group and place the four additional hard courts on the northern piece of property. He requested a consensus from Council to approve the design to move forward to meet the state appropriations deadline of June 30, 2025 and requested a consensus from Council to enclose one court.

A consensus was reached among Council to move forward with the 11,000 sq. ft. building and have future conversations on the location, parking and elevation, not to exceed the budget.

CITY ATTORNEY ANNOUNCEMENTS – N/A

CITY COUNCIL COMMENTS – Council Vice President Burgess said Sergeant Dixon's funeral was very touching and moving.

Councilwoman Wilkeson said Sergeant Dixon's funeral was moving with the motorcade. She said every motorcycle was parked perfectly with helmets ready to take him to his permanent resting place. She thanked the Pasco County Sheriff's Office who took Police Chief Brewer and his team's vision to fruition. She thanked the team who put together Pigz in Z'hills that was a great success.

Councilman Proctor thanked the police department and public works department for their efforts with the Pigs in Z'hills event and said everything was nice and clean the next morning.

Councilman Spina spoke about leadership in the Police Department. He said the police department is a paramilitary organization and he was moved to see the compassionate side of the Police Chief and police officers. Police Chief Brewer was the conduit for Peggy Dixon, Sergeant Dixon's wife; Lt. Gardner worked with the Honor Guard and Lt. Hillen held it together while delivering a speech about a friend he loved. The department relied on each other and pulled together.

Council President Smith said the ceremony and memorial in front of the police department helps with the healing, very respectful. He met with staff and representatives from the University of Florida to discuss ways to conserve irrigation water. He said young people today are looking for work at home jobs and we need to think about that, it's a changing job world.

Meeting Adjourned: 8:42 p.m.
Submitted by Lori L. Hillman

MAYOR'S CAUCUS

A Mayor's Caucus was held on February 20, 2024 at 5:30 p.m. in the Council Chambers of City Hall.

Council Vice President Kenneth Burgess called the meeting to order at 5:30 p.m. Roll call was taken. Present were members Charles Proctor, Kenneth Burgess, Jodi Wilkeson, Steven F. Spina, Ph.D., and Mayor Melonie Bahr Monson. Lance A. Smith was absent. City Manager William Poe was present. City Attorney Matthew Maggard was absent.

1. ACCEPT CANDIDATE PETITIONS

Mayor Monson presented Candidate Petitions for Council Seat 3:

1.1 **CITY COUNCIL SEAT 3**	**Certified Signatures**
Sam R. Turgeon	25
Jodi Wilkeson	25

Charles Proctor moved to accept the candidate petition certifications for Council Seat 3. Seconded by Steve Spina. Motion passed unanimously, 4-0.

Mayor Monson presented Candidate Petitions for Council Seat 5:

1.2 CITY COUNCIL SEAT 5	**Certified Signatures**
Manny Funes	25
Charles Edward Proctor	25

Steve Spina moved to accept the candidate petition certifications for Council Seat 5. Seconded by Jodi Wilkeson. Motion passed unanimously, 4-0.

2. **CITIZEN COMMENTS**

N/A

Meeting Adjourned: 5:33 p.m.
Submitted by Lori L. Hillman
(Not Present at Meeting)

City Council Meeting
February 26, 2024

Action Item

CONSENT ITEMS 2.3

Award of Bid, Number ITB 2023-002, for N.E. Sewer Force Main and Water Main Phase 3 to US Water

Issue:

This bid is to install approximately 12,500 ft of sewer force main from the intersection of Hwy301 and Kossik, west to Ft. King Rd. then north to Phelps Rd. and south to about Sunshine Rd.
Also, to install approximately 4,100 ft of 12" water main from Ft. King Rd. east to the Greenslope and Kossik intersection.

Background:

This part of the overall project will further allow the city to provide water and sewer services to current and future residents of the City and Pasco County.

Attachment(s):

1. Exhibit A - ITB 2023-02(30378166.1)
2. Exhibit B - ITB 2023-02(30378161.1)
3. Exhibit C - ITB 2023-02(30378163.1)
4. Exhibit D - ITB 2023-02(30378165.1)
5. Exhibit E - ITB 2023-02(30378169.1)

Fiscal Impact:

The City received 10 bids on the project with a range of $2,511,998.42 to 5,565,927.00.
The cost estimate provided in the bid was $4.5 million. The low bid came back as $2,511,988.42, which includes a 10% contingency allowance.

Staff Recommendation:

Staff recommends approval to the City Council as presented.

AGENCY:		INVITATION TO BID
CITY OF ZEPHYRHILLS ATTN: PURCHASING DEPT 5335 8TH STREET ZEPHYRHILLS, FL 33542	Zephyrhills jump right in	Response Acknowledgement

PURCHASING AGENT: Karen Miller	AN EQUAL OPPORTUNITY EMPLOYER	
Phone: 813-780-0000 x3536	FLORIDA TAX EXEMPT	#85-8012740166C-4
Email: kmiller@ci.zephyrhills.fl.us	FEDERAL IDENTIFICATION NUMBER	#59-6000455

Obtained ALL Bid Documents and Submit Q&A and Responses electronically on: OPENGOV - LINK ON WEBSITE WWW.CI.ZEPHYRHILLS.FL.US

BID/PROPOSAL NUMBER	DISTRIBUTION DATE	BID/PROPOSAL TITLE	BID/PROPOSAL RESPONSES OPENING DATE/TIME
ITB-2023-02	11/20/2023	Northside Water/Wastewater Forcemain-Phase 3	OPENGOV Online- Friday, January 12, 2024 before 10 AM

TELE CONFERENCE DATE GoTo Meetng ☒ Strongly Recommended ☐ None	RESPONSES RECEIVED AFTER ABOVE
DATE: 12-4-2023 TIME: 10:00 AM 2nd Floor Conference Room	DATE AND TIME
GoTo LINK: https://meet.goto.com/159259221	WILL NOT BE ACCEPTED
Call: 1-224-501-3412 ACCESS CODE: 159-259-221	Bid Bonds must be received

SITE VISIT: After the Meeting

VENDOR MUST COMPLETE THE BELOW AREAS AND RETURN FORM, NOTARIZED. FORM IS REQUIRED.

RESPONDER'S NAME/ADDRESS:	If returning as a "NO" state reason:
TELPHONE NUMBER:	
EMAIL ADDRESS:	

I certify this Response is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a Response for the same materials, supplies or equipment, and is in all respects fair and without collusion or fraud. I agree to all conditions of this Bid/Proposal and certify that I am authorized to sign this Response for the company. In submitting a Response to the City of Zephyrhills the Responder offers and agrees that if this Response is accepted, the Company will convey, sell, assign or transfer to the City of Zephyrhills all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the Anti-trust laws of the United States and the State of Florida for price fixing relating to the particular commodities or services purchased or acquired by the City of Zephyrills. At the City's discretion, such assignment shall be made and become effective at the time the City tenders final payment to the Company.

FEDERAL EMPLOYER ID NUMBER OR SS NUMBER:

X

AUTHORIZED SIGNATURE

PRINTED NAME/TITLE

THIS FORM MUST BE NOTARIZED BELOW

Sworn to and subscribed to me this ___ day of _____, 2024

Personally known: ☐ Or produced identification: ☐

Type of ID: _____

_____ _____

Notary Signature State

My commission expires: _____

AFFIX NOTARY STAMP BELOW

BONDS

An EBond shall be included in your uploaded response or a certified check delivered to City Hall before the deadline for an amount not less than five (5%) of the total bid price and shall be made payable to the City as a guarantee that the Bidder will not withdraw his bid for a period of forty-five (45) days after bid closing time. Bid, Payment and Performance Bond and all Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

THE CITY OF ZEPHYRHILLS RESERVES THE RIGHT TO REJECT ANY OR ALL PROPOSALS, TO WAIVE INFORMALITIES, AND TO ACCEPT ALL OR ANY PART OF ANY RESPONSE/PROPOSAL AS MAY BE DEEMED TO BE IN THE BEST INTEREST OF THE CITY UNLESS OTHERWISE NOTED, PAYMENT OF GOODS OR SERVICES PROVIDED AS A RESULT OF THIS SOLICITATION WILL BE MADE PER FLORIDA STATUTE. ALL VENDORS MUST SUBMIT A COMPLETED W-9 FORM.

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BID RESPONSE FORM

Detailed Bid Form to be Submitted on Page 6, Technical Specifications

In accordance with the Specifications contained herein, I certify that any and all information contained in this bid response is true; and I further certify that this bid is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a bid for the same materials, supplies, equipment, or services and is in all respects fair and without collusion or fraud. I agree to abide by all terms and conditions of the bid, and certify that I am authorized to sign for the applicant firm. *Please print the following and sign your name.*

Amount of Base Bid	$ _____
10% Contingency *Contingency is not guaranteed.*	$ _____
Total Contract Sum (Amount of Bid + Contingency)	$ _____

Any contingency items shall be communicated by written change order and shall be approved by both the Owner and Contractor.

Total Contract Sum of Bid in Words: _____

_____

_____

The **BIDDER** must submit a bid on all items contained in specification or the bid shall be considered irregular. The **OWNER** reserves the right to accept or reject the bid. The **OWNER**, or his representative, further reserves the unqualified right to determine whether any particular item or items or materials, equipment, or whatsoever is an approved equal, and reserves the unqualified right to a final decision regarding the approval or rejection of the same. The bid selection shall be based on the apparent low bidder for the **"TOTAL CONTRACT SUM"**.

Add'l Documents Included:

- ☐ Bid Form
- ☐ Bid Bond/Check
- ☐ References
- ☐ Public Entity Crimes
- ☐ License(s) copies
- ☐ Drug Free Workplace
- ☐ No-Bid
- ☐ Page 22, Signature/Seal
- ☐ Addenda Affidavit
- ☐ E-Verify
- ☐ Non Collusive
- ☐ Certification re: Debarment, Suspension, Ineligibility & Voluntary Exclusion

NAME, ADDRESS, AND SIGNATURE OF BIDDER:

NAME: _____ **TITLE:** _____

ADDRESS: _____

PHONE: _____ **FAX:** _____

E-MAIL ADDRESS: _____

BIDDER SIGNATURE: _____ **DATE:** _____

Corporate Seal or Notarization below date

BID REQUIREMENTS

Bid documents, plans, addendums can be viewed and downloaded from **OPENGOV** at https://www.https://procurement.opengov.com/portal/zephyrhillsfl A link to **OPENGOV** can be found on the City's Website, www.ci.zephyrhills.fl.us, Click on Government, Purchasing, **OPENGOV**, SIGNUP and you will be able to follow our solicitation activity after signup. It is your responsibility to ensure you have downloaded all addendums published before the bid opening. You must be a registered vendor for the City of Zephyrhills. Registration is FREE. Your response and all required documentation are to be **submitted through OPENGOV electronically before the date and time listed for responses**.

Bid Bond: There are two methods of providing your solicitation bid bond. The **first** and preferred method is by an EBond which can be electronically uploaded with your solicitation response. The **second** method is to provide a certified check and deliver it to City Hall, 5335 8th Street, Zephyrhills, Florida 33542 before the deadline. Shall be for an amount not less than five percent (5%) of the total bid price and shall be made payable to the City as a guarantee that the Bidder will not withdraw his bid for a period of forty-five (45) days after bid closing time.

The Bid Bond (EBond or Certified Check) provides as a guarantee that if the bid proposal is accepted, the bidder will executed and execute the contract and furnish a Payment and Performance Bond at least equal to one hundred percent (100%) of the contract price within ten (10) days after Notice of Award of the contract.

The bid package language accommodates for all types of services and/or purchases.

TELE/PRE-CONFERENCE: This tele/pre-conference meeting is non-mandatory but **strongly** recommended to discuss the requirements of this solicitation. This has been scheduled for **Monday, December 4, 2023 at 10:00 AM**. This meeting will assure all bidders share the same information and have a fair opportunity to bid this project. It is recommended all vendors visit the locations to look at the requirements listed in this solicitation.

GoTo Link: **https://meet.goto.com/159259221**
Phone: **+1(224)501-3412**
Access Code: **159-259-221**

You may need to type the link as cutting/pasting may not work.

Payment and Performance Bond and All Insurance Shall be Secured from or Countersigned by an Agency or Surety Company Recognized in Good Standing and Authorized to do Business in the State of Florida. If at any time the Owner for justifiable cause shall be or become dissatisfied with any Surety, then upon the Performance of Payment Bonds, the Contractor/Vendor shall within ten (10) days after notice from the Owner, substitute an acceptable bond (or Bonds) in such form and sum and signed by such other Surety or Sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor/Vendor. No further payments shall be deemed due and shall not be made until new Surety or Sureties shall have furnished such an acceptable bond to the Owner.

Indemnity: Contractor/vendor shall defend, indemnify and hold harmless the City of Zephyrhills and all of the City of Zephyrhills's officers, agents, and employees from and against all claims, liability, loss and expense, including reasonable costs, collection expenses, attorneys' fees, and court costs which may arise because of the negligence (whether active or passive), misconduct, or other fault, in whole or in part (whether joint, concurrent, or contributing), of contractor/vendor, its officers, agents or employees in performance or non-performance of its obligations under the Agreement generated from this solicitation. Contractor/vendor recognizes the broad nature of this indemnification and hold harmless cause, as well as the provision of a legal defense to the City of Zephyrhills when necessary, and voluntarily makes this covenant and expressly acknowledges the receipt of such good and valuable consideration provided by the City of Zephyrhills in support of these indemnification, legal defense and hold harmless contractual obligations in accordance with the laws of the State of Florida. This clause shall survive the

termination of the Agreement from this solicitation. Compliance with any insurance requirements required elsewhere within the Agreement shall not relieve the contractor/vendor of its liability and obligation to defend, hold harmless and indemnify the City of Zephyrhills as set forth in this article of the Agreement.

It is further agreed that liability and exposure for indemnification (including, but not limited to the amounts of any indemnification owed by a governmental entity) will be limited to and governed by the provisions of Section 768.28(5), Florida Statutes.

Exparte Communication: Please note that to insure the proper and fair evaluation of a bid proposal, the City of Zephyrhills prohibits exparte communication (i.e., unsolicited) initiated by a bidder to the City official or employee evaluating or considering the bids prior to the time a bid decision has been made. Any communication between bidder and the City will be initiated by the appropriate City official or employee inorder to obtain information or clarification needed to develop a proper and accurate evaluation of the bid. Any exparte communication may be grounds for disqualifying the offending bidder from consideration or award of the proposal then in evaluation or any future proposal.

INSTRUCTIONS TO BIDDERS

1. ***Proposals***: Responses/Proposals will be submitted through BidNet Direct meeting all requirements listed for furnishing all transportation, labor, material and equipment, and performing all operations required for the construction and completion of the work herein specified and shown on the drawings.

2. ***Additional Information or Clarification***: Request for additional information or clarifications must be made in writing and can be e-mailed to kmiller@ci.zephyrhills.fl.us or through BidNet Direct (preferred). Any request for additional information or clarification must be received in writing **no later than Friday, December 29, 2023 by 10:00 A.M.**

3. ***Equivalent Brand Names***: When the City does not wish to rule out other competitor's brands or makes, the phrase "OR EQUIVALENT" is specified. Whenever a material, article or piece of equipment is identified on the plans or in the specifications by reference to manufactures' or vendors' names, trade names, catalogue numbers, etc, it is intended merely to establish a standard; and, any material, article or equipment of other manufacturers and vendors that will perform adequately the duties imposed by the general design and will be considered equally acceptable provided the material, article or equipment so proposed, is, in the opinion of the Architect/Engineer, of equal substance and function. It shall not be purchased or installed by the Contractor/Vendor without the Architect/Engineer's written approval. However, if a product other than the specified bid, it is the bidder's responsibility to identify such product in its bid, and prove to the City that said product is equal to or better than the product specified. The City shall have the sole and absolute discretion to

   determine whether the product identified by the bidder is equal to or better than the product specified by the City. Manufacturers' certificates of specifications conformance of materials may be required by the City; these certificates shall be furnished at no cost to the City. Unless otherwise specified, evidence in the form of samples may be requested if the proposed brand is other than specified by the City. If samples should be requested, such samples must be received by the City within the time specified after a formal request is made. Any items which fall into this category are to be submitted to the City for review and approval no later **than Friday, December 29, 2023 by 10:00 A.M.**

4. ***Bidder***: A bidder is an individual, firm, or corporation submitting a Proposal to the City for the work contemplated.

5. ***Response Forms***: The bidder shall submit his Proposal on the forms furnished herewith. The blank spaces shall be filled in correctly for each lump sum item and for every item for which a quantity is given. The bidder shall state the price, typewritten or printed in ink, for which he proposes to do each item of work called for.

6. ***Signature on Response***: The bidder must sign his Response correctly. If the response is made by an individual, he shall sign and his name and his post office address shall be shown. If made by a firm or partnership, signature shall be by a general partner and the name and post office address of each member of the firm or partnership shall be shown. If made by a corporation, the person signing the Response shall show the name of the state under the laws of which the corporation was chartered, also the name and business address of its president, secretary and treasurer. The Response shall bear the seal of the corporation attested by the secretary. Anyone signing the Response as agent shall file with the Response legal evidence of his authority to do so.

7. ***Familiarity with Laws***: The bidder is assumed to be familiar with all Federal, State and local laws, ordinances, rules and regulations that in any manner affect the work. Ignorance on the part of the bidder will in no way relieve him from responsibility.

8. ***Examination of Drawings, Specifications and Site of Work***: The bidder shall visit the site of the proposed work and familiarize himself with the nature and extent of the work and all local conditions that may in any manner affect the work to be done and the equipment, materials and labor required. By submitting his bid, the bidder acknowledges that he has visited the site and that he is otherwise familiar with the nature and extent of the work and all local conditions that may in any manner affect the work to be done and the equipment, material and labor required. He is required to examine carefully the drawings and specifications and Form of Agreement and Bond and to inform himself accurately and completely regarding any and all conditions and requirements contained herein that may in any manner affect the work to be performed.

9. ***Qualifications of Bidders***: The contract(s), if awarded, will be awarded only to a responsible contractor/vendor who is qualified by experience to do/supply the work specified herein. The bidder shall submit with his Proposal evidence satisfactory to the City, of his experience in like work and when requested he shall show that he has prepared the necessary organization, capital, equipment and machinery to complete the work to the satisfaction of the City within the time limit stated in the Contract Documents.

10. ***Disqualification of Bidders***: No bidder shall submit more than one proposal, and reasonable grounds for believing that a bidder interested in more than one Proposal for the same work will cause rejection of all Proposals in which such bidder, or bidders, are believed to be interested. Any or all Proposals will be rejected if there is reason to believe that Collusion exists among the bidders and no participants in such collusion will be considered in future Proposals for the same work.

11. ***Right to Reject Submittal Response***: Right is reserved to reject any or all Proposals and to disregard technical errors.

12. ***Return of Guaranty***: As soon as the bids have been compared, the City may, at its discretion, return the guaranty deposit accompanying such Proposals as in its judgment would not likely be considered in making the award. All other proposal guaranties will be held until the Agreement and Bond have been executed, after which they will be returned to the respective bidders.

13. ***Execution of the Agreement***: The individual, firm or corporation to which the contract has been awarded shall sign the necessary Agreement with the City, and return it to the City within **ten (10)** days. No contract shall be considered binding upon the City until it has been properly executed.

14. ***Failure to Execute the Agreement***: Failure on the part of the successful bidder to execute the Agreement as required will be just cause for the annulment of the award, and in the event of the annulment of the award, the Bidder shall forfeit his bid bond. This forfeiture shall not be construed as a penalty, but as reasonable, fixed and liquidated damages because of the Bidder's failure to enter into Agreement with the City. The award may then be made to the next lowest acceptable bidder, or the work re-advertised as the City may elect.

15. ***Withdrawal of Response***: A bidder may withdraw his Proposal without prejudice to himself, not later than the day and hour set for opening of bids, by communicating his purpose in writing to the City and his Proposal will be returned to him unopened.

16. ***Interest of Member of or Delegate to Congress.*** No member of or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this contract or any benefit that may arise therefrom, but this provision shall be construed to extend to this contract if made with a corporation for its general benefit.

17. ***Basis of Award***: Considerations will be given to price, experience of the bidder in this type of work, and their conformity with the specifications. Except where the City exercises the right reserved herein to reject any or all bids and subject to the restrictions stated hereinabove, the Contract shall be awarded by the City to the responsible Bidder who has submitted either the lowest responsive bid, or the lowest responsive bid on the base bid including such alternates/optional items as the City determines to be in its own best interests, and application of any preferences, as applicable. The quality of the material to be supplied, their suitability to requirements, and guarantee clauses shall be taken into consideration. No significant deviation for the term of this specification is acceptable. The City of Zephyrhills reserves the right to reject any or all bids as authorized by law, to accept in whole or in part any such bid, and to award the contract to other than the lowest bidder at its discretion, if the best interest of the City of Zephyrhills is thereby served.

18. ***Award of Contract***: The City reserves the right to reject any or all bids, or any part of any bid, to waive any informality in any bid, or to re-advertise for all or part of the work contemplated. The City reserves the right, prior to award of Contract, to add to the scope of the project any item or any combination of items which may exceed the total bid price for the project.

    Considerations will be given to price, experience of the bidder in this type of work, and their conformity with the specifications. Awards will be made to the lowest responsible bidder. The quality of the material to be supplied, their suitability to requirements, and guarantee clauses shall be taken into consideration. No significant deviation for the term of this specification is acceptable. The City of Zephyrhills reserves the right to reject any or all bids as authorized by law, to accept in whole or in part any such bid, and to award the contract to other than the lowest bidder at its discretion, if the best interest of the City of Zephyrhills is thereby served.

    A pre-construction meeting shall take place after the award of the contract. This meeting is mandatory pre-construction meeting. The attendees of this meeting shall be the Contractor and City Staff.

    In the event the contract is awarded to this Bidder, he will enter into a formal written agreement with the City in accordance with the accepted bid within ten (10) calendar days after said contract is

submitted to him. The Bidder further agrees that in the event of the Bidder's default or breach of any of the agreements of this proposal, the said bid deposit shall be forfeited as liquidated damages.

If awarded this contract, It is hereby understood and mutually agreed, by and between the Contractor/Vendor and the Owner, that the date of beginning and the time for completion as specified in the contract of the work to be done hereunder are ESSENTIAL CONDITIONS of this contract; and it is further mutually understood and agreed that the work embraced in this contract shall be commenced on a date to be specified in the "Notice to Proceed."

It is further agreed where under the contract an additional time is allowed for the completion of any work, the time limit fixed by such extension shall be of the essence of this contract. Provided, that the Contractor/Vendor shall not be charged with liquidated damages or any excess cost when the Owner determines that the Contractor/Vendor is without fault and the Contractor's or Vendor's reason for the time extension is acceptable to the Owner: Provided, further, that the Contractor/Vendor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

(a) To any preference, priority or allocation order duly issued by the Government.
(b) To any delays of Subcontractors or suppliers occasioned by any of the causes specified in subsection (a).

Provided, further, that the Contractor/Vendor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor/Vendor within a reasonable time of its decision in the matter.

The Contractor/Vendor agrees that said work shall be prosecuted regularly, diligently, and uninterrupted at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor/Vendor and the Owner, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality. The Bidder agrees to supply all materials within thirty (30) days after successful agreement has been signed by both parties and after contract has been submitted to them and receipt of Notice to Proceed.

If the said Contractor/Vendor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor/Vendor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner the amount

specified in the contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor/Vendor shall be in default after the time stipulated in the contract for completing the work

Should the contractor/vendor fail to substantially complete and supply the materials listed under this contract and make it available for beneficial use on or before the date stipulated for completion (or such later date as may result from extension of time granted by City), he shall pay the City, as liquidated damages, the sum of **$1000.00** for each consecutive calendar day that terms of the contract remain unfulfilled beyond date allowed by the contract, which sum is agreed upon as a reasonable and proper measure of damages which City will sustain per diem by failure of Contractor/vendor to supply the materials within the time stipulated; it being recognized by City and Contractor/vendor that the injury

to City which could result from a failure of Contractor/vendor to complete on schedule is uncertain and cannot be computed exactly. In no way shall costs for liquidated damages be construed as a penalty.

Any notice to any Contractor/Vendor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted, by certified or registered mail, to the said Contractor/Vendor at his last given address or delivered in person to the said Contractor/Vendor or his authorized representative on the work.

19. ***Conditions***: The bidder shall list on a separate sheet of paper any variations from, or exceptions to, the conditions and specifications of this bid. This sheet shall be labeled "Exceptions to Bid Conditions and Specifications", and shall be attached to the bid. Any variations or exceptions shall meet or exceed the plans and specifications.

20. ***Quantities***: An estimate of the quantities of work to be done and/or materials to be furnished is given in the specifications. It is the result of the City's calculations and is believed to be correct. It is given only as a basis of comparison of bids and the City does not expressly or by implication agree that the actual quantities involved will correspond exactly therewith; nor shall the bidder plead misunderstanding or deception because of such estimates of quantities, or of the character, location, or other conditions pertaining to the work performed or materials furnished in accordance with the plans and specifications. It is understood that the quantities may be increased or decreased without in any way invalidating the unit bid prices.

21. ***Public Records***: In accordance with 119.0701 F.S. Contractor shall:

IF CONSULTANT OR CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONSULTANT'S OR CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT OR CONTRACT, THEY SHALL CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:

LORI HILLMAN, CITY CLERK
CITY OF ZEPHYRHILLS
5335 8TH STREETH
ZEPHYRHILLS, FLORIDA 33542
LHILLMAN@CI.ZEPHYRHILLS.FL.US
813-780-0000

22. ***Correction of Work***. All work, all materials, whether incorporated in the work or not, all processes of manufacture, and all methods of construction shall be at all times and places subject to the inspection of the Architect/Engineer who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture, and methods of construction for the purposes for which they are used. Should they fail to meet his approval they shall be forthwith reconstructed, made good replaced and/or corrected, as the case may be by the Contractor/Vendor at his own expense. Rejected materials shall immediately be removed from the site. If, in the opinion of the Architect/Engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor/Vendor hereunder shall be reduced by such amount as in the judgment of the Architect/Engineer shall be equitable.

23. ***Subsurface Conditions Found Different***. Should the Contractor/Vendor encounter sub-surface and/or latent conditions at the site materially differing from those shown on the Plans or indicated in the Specifications, the Contractor/Vendor shall immediately give notice to the Architect/Engineer of such conditions before they are disturbed. The Architect/Engineer will thereupon promptly investigate the conditions, and if he finds that they materially differ from those shown on the Plans or indicated in the specifications he will at once make such changes in the Plans and/or Specification, as the Contractor/Vendor may find necessary, any increase or decrease of cost resulting from such changes to be adjusted in the manner provided in Paragraph 17 of the General Conditions.

24. ***Claims for Extra Cost***. No claim for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Architect/Engineer approved by the Owner, as aforesaid, and the claim presented with the first estimate after the changed or extra work is done. When work is performed under the terms of subparagraph 17 of the General Conditions, the Contractor/Vendor shall furnish satisfactory bills, payrolls, and vouchers covering all items of cost and when requested by the Owner, give the Owner access to accounts relating thereto.

25. ***Termination (Cause and/or Convenience)***.

a. This contract may be terminated in whole or in part in writing by either party in the event of substantial failure by the other party to fulfill its obligations under this contract through no fault of the terminating party, provided that no termination may be effected unless the other party is given (1) not less than ten (10) calendar days written notice (delivered by certified mail, return receipt requested) of intent to terminate and (2) an opportunity for consultation with the terminating party prior to termination.

b. This contract may be terminated in whole or in part in writing by the local government for its convenience, provided that the other party is afforded the same notice and consultation opportunity specified in 1(a) above.

c. If termination for default is effected by the local government, an equitable adjustment in the price for this contract shall be made, but (1) no amount shall be allowed for anticipated profit on unperformed services or other work, and (2) any payment due to the contractor/vendor at the time of termination may be adjusted to cover any additional costs to the local government because of the contractor's or vendor's default.

If termination for convenience is affected by the local government, the equitable adjustment shall include a reasonable profit for services or other work performed for which profit has not already been included in an invoice.

For any termination, the equitable adjustment shall provide for payment to the contractor/vendor for services rendered and expenses incurred prior to receipt of the notice of intent to terminate, by the contractor/vendor relating to commitments (e.g., suppliers, subcontractors) which had become firm prior to receipt of the notice of intent to terminate.

d. Upon receipt of a termination action under paragraphs (a) or (b) above, the contractor/vendor shall (1) promptly discontinue all affected work (unless the notice directs otherwise) and (2) deliver or otherwise make available to the local government all

data, drawings, reports specifications, summaries and other such information, as may have been accumulated by the contractor/vendor in performing this contract, whether completed or in process.

e. Upon termination, the local government may take over the work and may award another party a contract to complete the work described in this contract.

f. If, after termination for failure of the contractor/vendor to fulfill contractual obligations, it is determined that the contractor/vendor had not failed to fulfill contractual obligations, the termination shall be deemed to have been for the convenience of the local government. In such event, adjustment of the contract price shall be made as provided in paragraph (c) above.

PRELIMINARY MATTERS

Delivery of Bonds: Simultaneously with the execution and delivery of the Agreement, the Contractor/Vendor shall deliver to the City the required executed Bonds. Additional copies will be furnished, upon request, at the cost of reproduction.

Before Starting Work: Before starting the work at the site, the Contractor/Vendor shall furnish the City with certificates of insurance and schedules as required by the City and a conference will be held to review the above schedules, to establish procedures for handling Applications for Payment and to establish a working understanding between the parties as to the Project. Present at the conference will be the City and its representative, the Contractor/Vendor and his Superintendent.

The Contractor/Vendor shall furnish a list of key personnel within **fifteen (15)** calendar days of starting construction. This list should include the superintendent, all personnel at the site and their assignments, name, title, telephone numbers (work and cellular) along with email addresses.

Before undertaking the Work, the Contractor/Vendor shall carefully study and compare the Contract Documents and check and verify all figures shown thereon and all field measurements. He shall at once report in writing to the City any conflict, error or discrepancy which he may discover. The Contractor/Vendor assumes full responsibility for having familiarized himself with the nature and extent of the Contract Documents, Work, locality and local conditions that may in any manner affect the Work to be done and represents that he has visited the site.

The City shall give the Contractor/Vendor a written Notice to Proceed, stating a date on which it is expected that the Contractor/Vendor will start the work. No work shall be done prior to the date on which the Work is to start.

The Contractor/Vendor Time shall commence to run on the date of the Notice to Proceed.

CORRELATION, INTERPRETATION, AND INTENT OF CONTRACT DOCUMENTS

For Construction: It is the intent of the Specifications and Drawings to describe a complete Project to be constructed in accordance with the Contract Documents. The Contract Documents comprise the entire

Agreement between the City and the Contractor/Vendor. They may be altered only by a Modification The Contract Documents cover, with explicit provisions, all matters relating to the work which the Contractor/Vendor undertakes to construct or perform in full compliance with such provisions. It is understood that the Contractor/Vendor has, by personal examination and inquiry, if necessary, satisfied himself as to all local conditions and as to the meaning, requirements and reservations of the Contract Documents. No deviation will be allowed from the City's interpretation thereof. The intent of the Contract Documents is to include all labor, materials, equipment, and transportation necessary for the proper execution of the work. The Contractor/Vendor shall make plural and complete all work which, to avoid needless repetition or for the sake of brevity, has been shown singly or partially indicated. The Contractor/Vendor shall follow the Drawings and execute all work in strict accordance therewith and with the kind and quality of materials indicated and specified. Materials or work described in words which, when so applied, have a well-known technical or trade meaning shall be held to refer to such recognized standards. Any deviation from Specifications, which may be required by the exigencies of construction, shall in all cases conform to written instructions of the City. The applicable provisions of the Contract Documents shall apply with equal force to all work, including extra work, performed under this Contract, whether performed either directly by the Contractor/Vendor or by any Subcontractor.

The Contract Documents are complementary; what is called for by one is as binding as if called for by all. If the Contractor/Vendor finds a conflict, error or discrepancy in the Contract Documents, he shall call it to the City's attention in writing before proceeding with the Work affected thereby. In resolving such conflicts, errors and discrepancies, the documents shall be given precedence in the following order: Agreement, Special Conditions, General Conditions, Specifications, including any Addenda, Drawings,

Invitation to Bid and Contractors/Vendors Bid. Any work that may reasonably be inferred from the Specifications or Drawings as being required to produce the intended result shall be supplied whether or not it is specifically called for. Work, materials or equipment described in words which so applied have a well-known technical or trade meaning shall be deemed to refer to such recognized standards.

Insurance: Contractor/vendor shall, at its sole cost and expense, procure and maintain throughout the term of the contract, Comprehensive General Liability and Worker's Compensation insurance, including Employer Liability insurance, with minimum policy limits of $1,000,000 (this could be $2,000,000 depending on the amount of the contract) combined Single Limits, or to the extent and in such amounts as required and authorized by Florida law, and will provide endorsed certificates of insurance generated and executed by a licensed insurance broker, brokerage or similar licensed insurance professional evidencing such coverage, and naming the City of Zephyrhills as a named, additional insured, as well as furnishing the City of Zephyrhills with a certified copy, or copies, of said insurance policies. Certificates of insurance and certified copies of these insurance policies must accompany the signed contract. Said insurance coverages procured by the contractor/vendor as required herein shall be considered, and the contractor/vendor agrees that said insurance coverages it procures as required herein shall be considered, as primary insurance over and above any other insurance, or self-insurance, available to the City of Zephyrhills, and that any other insurance, or self-insurance available to the City of Zephyrhills shall be considered secondary to, or in excess of, the insurance coverage(s) procured by the contractor/vendor as required.

Nothing shall be construed to extend the City of Zephyrhills's liability beyond that provided in section 768.28, Florida Statutes.

Builders' Risk Coverage: ***For any contracts that may apply to the following in the first sentence should also include statement below.*** If this solicitation includes: (1) construction of a new above-ground structure or structures, or (2) any addition(s), improvement(s), alteration(s), or repair(s), to an existing above-ground structure or structures, or (3) the installation of machinery or equipment into an existing

structure or structures, the Contractor shall provide, in a policy acceptable to the City, "all risk" (i.e., Special Form) property insurance on any such construction, additions, machinery or equipment. The amount of the insurance shall be no less than the estimated replacement value at the time of the City's final acceptance of such new structures, addition(s), improvement(s), alternation(s), repair(s), machinery or equipment. The coverage shall not be subject to any restriction with respect to occupancy or use by the City and, subject to thirty (30) days' prior written notice to the City shall remain in full effect until final acceptance by the City. In addition, the City, the Professional, and the Contractor's subcontractors of any tier, shall be additional insureds on this policy. The insurance shall include a deductible no greater than one percent (1%) of the Contract amount, or $25,000, whichever is smaller, for which the Contractor shall be responsible. The risk of loss whether insured or not shall remain with the Contractor until final acceptance. Upon request, Contractor shall furnish to the City complete copies of the insurance policy.

Liens: The Contractor/vendor shall indemnify and save harmless the City from all claims, demands, causes of action, suits of whatever nature arising out of the services, labor, and materials furnished by the Contractor/Vendor or its Subcontractors under this Contract, and from all laborers', materialmen's and mechanics' liens upon the property which the work is located arising out of the services, labor, and materials furnished by the Contractor/Vendor or any of its Subcontractors under this Contract; and shall keep said property free and clear of all liens, claims, and encumbrances arising from the performance of this Contract by the Contractor/Vendor or its Subcontractors; the Contractor/Vendor hereby waiving all rights to claim such lien on the City's properties.

If required, the Contractor/Vendor shall furnish at the City's option either (a) a good and sufficient release or waiver of lien from itself, every subcontractor, materialman, laborer, and other person furnishing services, labor, or materials in connection with the work or (b) receipts in full, together with an affidavit that the receipts cover all the services, labor, and materials furnished by the Contractor/Vendor or its Subcontractors for which a lien might be filed except as covered by the releases and waivers of liens; but if any Subcontractor, laborer, materialman, or other person refuses to furnish a waiver or release a receipt in full, the Contractor/Vendor may furnish a Bond satisfactory to the City to indemnify the City against any claim or lien or otherwise. (c) Surety Bond may be furnished by the Contractor/Vendor or his Surety as a guarantee that he will execute the work in accordance with the terms of the Contract, and that he shall make all payments for all labor, materials and supplies directly or indirectly for the work. If Surety Bond is required by the City, Contract price will be increased by an amount equal to the cost of securing said Bond.

Definitions: The following terms are respectively defined as follows:

- Contractor/Vendor: A person, firm or corporation with whom the contract is made by the Owner/City.
- Subcontractor: A person, firm or corporation supplying labor and materials or only labor for at the site of the project for, and under separate contract or agreement with the Contractor/Vendor.
- Work on (at) the Project: Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the Contractor and any subcontractor.
- Owner: Can represent the City of Zephyrhills and/or property/business owners.

CONTRACTOR'S or VENDOR's RESPONSIBILITIES

Supervision and Superintendence: The Contractor/Vendor shall supervise and direct the Work efficiently and with his best skill and attention. He shall be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor/Vendor shall be responsible to see that the

finished Work complies accurately with the Contract Documents. The Contractor/Vendor shall accept full responsibility for the work until final acceptance. He shall protect the work against all loss or damage sustained during the progress of the work and promptly repair any damage done from any cause whatsoever. After acceptance of the work, Contractor's or Vendor's responsibility shall extend to defective or faulty work as later defined in these specifications.

The Contractor/Vendor shall keep on the Work site at all times during its progress, a competent resident superintendent who shall not be replaced without written consent of the City, under extraordinary circumstances. The Superintendent will be the Contractor's or Vendor's representative at the Site and shall have the authority to act on behalf of the Contractor/Vendor. He shall be present at the pre-construction conference. All communications given to the Superintendent shall be as binding as if given to the Contractor/Vendor.

Labor, Materials, Equipment, and Manufactured Articles: The Contractor/Vendor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. He shall at all times maintain good discipline and order at the site.

The Contractor/Vendor shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities, and all other facilities and incidentals necessary for the execution, testing, and initial operation and completion of the Work. Any work necessary to be performed after regular working hours, on Sunday or legal holiday, shall be performed without additional expense to the City.

All materials and equipment shall be new, except as otherwise provided in the Contract Documents. If required by the City, the Contractor/Vendor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. All material and workmanship shall in every respect, be in accordance with what, in the opinion of the City, is in conformity with approved modern practice.

Contractor's or Vendor's Title to Materials: No materials or supplies for the work shall be purchased by the Contractor/Vendor or by any Subcontractor subject to any chattel mortgage or under a conditional sale contractor/vendor or other agreement by which an interest is retained by the seller. The Contractor/Vendor warrants that he has good title to all materials and supplies used by him in the work, free from all liens, claims or encumbrances.

Request for Information (RFI): Immediately on discovery of the need for additional information the Contractor/Vendor shall submit a RFI to the Owner's representative, Project Manager.

Use of Premises: The Contractor/Vendor shall confine his equipment, the storage of materials and equipment and the operations of his workmen to areas permitted by law, ordinances, or permits and shall not unreasonably encumber the premises with materials or equipment. Materials stored without proper permits shall be promptly relocated upon request by the City at the Contractor's or Vendor's expense.

Record Drawings: The Contractor/Vendor shall keep one record copy of all Specifications, As-built Drawings, Addenda, Modifications and Shop Drawings at the site in good order and annotated to show all changes made during the construction process. These shall be available to the RPR and the Engineer. As-builts shall be delivered to them for the City and Engineer upon completion of the Project. Release of retainage shall be contingent upon delivery of red-lined "as-builts".

Supplementary Drawings: When, in the opinion of the City, it becomes necessary to explain more fully the work to be done, or to illustrate the work further, or to show any changes which may be required,

drawings, known as supplementary drawings, with specifications pertaining thereto, will be prepared by the Engineer.

The additional drawings and instructions supplied to the Contractor/Vendor will coordinate with the Contract Documents and will be prepared that they can be reasonably interpreted. The Contractor/Vendor shall carry out the work in accordance with the additional detail drawings and instructions. The Contractor/Vendor and the Architect/Engineer will prepare jointly: (a) a schedule, fixing the dates at which special detail drawings will be required, such drawings, if any, to be furnished by the Architect/Engineer in accordance with said schedule, and (b) a schedule fixing the respective dates for the submission of shop drawings; the beginning of manufacture, testing and installation of materials, supplies and equipment; and the completion of the various parts of the work; each such schedule to be subject to change from time to time in accordance with the progress of the work The supplementary drawings shall be binding upon the Contractor/Vendor with the same force as the drawings. Where such supplementary drawings require either less or more than the estimated quantities of work, credit to the City or compensations therefore to the Contractor/Vendor shall be subject to the terms of the agreement.

Shop or Setting Drawings: The Contractor/Vendor shall submit promptly to the Architect/Engineer four (4) copies of each shop or setting drawing prepared in accordance with the schedule predetermined as aforesaid. After examination of such drawings by the Architect/Engineer and the return thereof, the Contractor/Vendor shall make such corrections to the drawings as have been indicated and shall furnish the Architect/Engineer with four (4) corrected copies. If requested by the Architect/Engineer the Contractor/Vendor must furnish additional copies. Regardless of corrections made in or approval given to such drawings by the Architect/Engineer, the Contractor/Vendor will nevertheless be responsible for the accuracy of such drawings and for their conformity to the Plans and Specifications, unless he notifies the Architect/Engineer in writing of any deviations at the time he furnishes such drawings.

Architect/Engineer's Authority: The Architect/Engineer shall give all orders and direction contemplated under the contract and specifications, relative to the execution of the work. The Architect/Engineer shall determine the amount, quality, acceptability, and fitness of the several kinds of work and materials that are to be paid for under this contract and shall decide all questions which may arise in relation to said work and the construction thereof. The Architect/Engineer's estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties hereto relative to said contract or specifications; the determination or decision of the Architect/Engineer shall be a condition precedent to the Contractors/Vendors to receive any money or payment for work under this contract affected in any manner or to any extent by such question.

The Architect/Engineer shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work that may arise between the contractor/vendor under this contract and other Contractors/Vendors performing work for the City shall be adjusted and determined by the Architect/Engineer.

Safety and Protection: The Contractor/Vendor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. He shall take all necessary precautions for the safety of and shall provide the necessary protection to prevent damage, injury or loss to:

All employees on the Work and other persons who may be affected thereby.

All the Work and all materials or equipment to be incorporated therein, whether

in storage on or off the site.

Other property, including City property, at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The Contractor/Vendor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in the contract or by the City, or his duly authorized representatives. He shall notify the Architect/Engineer immediately. Any claim for compensation by the Contractor/Vendor shall be promptly submitted to the Architect/Engineer for approval.

The Contractor/Vendor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's Superintendent unless otherwise designated in writing by the Contractor/Vendor to the City.

SAFETY PLAN

A. It is the contractor's or vendor's responsibility to comply with OSHA standards and all regulations pertaining to the work including confined space entry.

B. Precaution shall be exercised at all times for the protection of persons and property. The safety provisions of applicable laws, and existing building and construction codes shall be guarded in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractor of America, and OSHA's Safety and Health Standards (29 CFR 1926/1910) U.S. Department of Labor, to the extent that such provisions are not in contravention of applicable law.

C. ***Safety Requirements***:

1. The Contractor/Vendor shall provide documentation on Means of Egress, Emergency Evacuation, Confined Space Entry, Lock Out – Tag Out, Hot Work Permit, Hurricane Preparedness, Right-to-Know / MSDS Sheets to the satisfaction of the City prior to commencement of any single job.
2. A Contractor/Vendor Process Safety Management Briefing will be held at the Pre-Construction Conference. The Contractor/Vendor will be required to attend this briefing and sign a form so stating that he has been briefed. A copy of this form is included in the Forms section of this package.

Trench Safety Act: Each contractor must submit with his bid an executed sworn certification that he will comply with the Trench Safety Act, Chapter 90-96, Florida Statues, on trench safety.

Emergencies: In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor/Vendor, without special instruction or authorization from the City, is obligated to act, at his discretion, to prevent threatened damage, injury or loss.

Assignability. The Contractor/Vendor shall not assign the whole or any part of this contract or any monies due or to become due hereunder without written consent of the Owner. In case the Contractor/Vendor assigns all of any part of any monies due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that right of the assignee in and to any monies due or to become due to the Contractor/Vendor shall be subject to prior claims of all persons, firms and corporations of services rendered or materials supplied for the performance of the work called for in this contract.

Mutual Responsibility of Contractors/Vendors. If, through acts of neglect on the part of the Contractor/Vendor, any other Contractor/Vendor or any subcontractor shall suffer loss or damage on the work, the Contractor/Vendor agrees to settle with such other Contractor/Vendor or subcontractor by agreement or arbitration if such other Contractor/Vendor or subcontractor will so settle. If such other Contractor/Vendor or subcontractor shall assert any claim against the Owner or account of any damage alleged to have been sustained, the Owner shall notify the contractor/vendor, who shall indemnify and save harmless the Owner against any such claim.

Subcontractors: The Contractor/Vendor shall not employ any Subcontractor against whom the City may have reasonable objection, nor will the Contractor/Vendor be required to employ any Subcontractor against whom he has reasonable objection. Within 30 calendar days after the date of the Award of Contract and before the City shall make any partial payments to the Contractor/Vendor, the Contractor/Vendor shall furnish to the City in writing for acceptance by the City a list of the names of the Subcontractors proposed for the principal portions of the work. The Contractor/Vendor shall not make any substitution for any Subcontractor who has been accepted by the City, unless the City determines that there is good cause for doing so.

The Contractor/Vendor shall be fully responsible for all acts and omissions of his Subcontractors and of persons directly or indirectly employed by them and of persons for whose acts any of them may be liable to the same extent that he is responsible for the acts and omissions of persons directly employed by him. Nothing in the Contract Documents shall create any contractual relationship between any Subcontractor and the City or any obligation on the part of the City to pay or to see to the obligation on the part of the City to pay or to see to the payment of any moneys due any Subcontractor, except as may otherwise be required by law. The City may furnish to any Subcontractor, to the extent practicable, evidence of amounts paid to the Contractor/Vendor on account of specific work done in accordance with schedule of values.

The divisions and sections of the Specifications and the identifications of any Drawings shall not control the Contractor/Vendor in dividing the work among Subcontractors or delineating the work to be performed by any specific trade.

The Contractor/Vendor agrees to bind specifically every Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the City. The terms of the Contract Documents shall control over any discrepancy in any other document.

Laws and Regulations: The Contractor/Vendor shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the work. If the Contractor/Vendor observes that the Specifications or drawings are at variance therewith, he shall give the City prompt written notice thereof, and any necessary changes shall be adjusted by an appropriate Modification. If the Contractor/Vendor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations and without such notice to the Engineer, he shall bear all costs arising therefrom; however, it will not be his primary responsibility to make certain that the drawings and Specifications are in accordance with such laws, ordinances, rules and regulations.

Permits and Protection of Public: The Contractor/Vendor shall be required to observe all the ordinances in relation to obtaining permits for occupying, excavating or in anywise obstructing the streets and alleys. He shall erect and maintain barricades and sufficient safeguards around all excavations, embankments or obstructions.

Where there are telephone, telegraph, light or power poles; water mains, conduits, pipe, or drains; or other construction either public or private; in or on the streets or alleys; the work shall be so conducted

that no interruption or delay will be caused in the operation or use of the same. Proper written notice shall be given and all the facilities afforded the owners of such construction encountered or likely to be encountered, as will enable them to preserve the same from injury.

Unless otherwise expressly provided for in the Specifications, the City will furnish to the Contractor/vendor all surveys necessary for the execution of the work.

The Contractor/Vendor shall procure and pay all other permits, licenses and approvals necessary for the execution of this contract and shall comply with all Florida Department of Environmental Protection requirements. Cost of building permits will be paid by the contractor. ***The selected Contractor/Vendor must be registered with the City of Zephyrhills Building Department before starting the project.***

Use of Premises: The Contractor/Vendor shall confine his equipment, the storage of materials and equipment and the operations of his workmen to areas permitted by law, ordinances, or permits and shall not unreasonably encumber the premises with materials or equipment. Materials stored without proper permits shall be promptly relocated upon request by the City at the Contractor's or Vendor's expense.

Quality Control: The Contractor/Vendor shall maintain quality control over suppliers, manufacturers, products, services, site-conditions, and workmanship to assure they meet or exceed requirements of Standard and local building codes.

Cleaning: The Contractor/Vendor shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the work. The Contractor shall clean up work site, interior and exterior of building, any and all equipment or fixtures must operate properly and not show any signs of damage or any defects. At the completion of the work he shall remove all waste materials, rubbish, and debris from and about the premises as well as all tools, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by the City. The Contractor/Vendor shall restore to their original condition those portions of the site for alteration by the Contract Documents.

Protection of Work and Materials: Facilities for handling of material and inspecting the work shall at all times be furnished by the Contractor/Vendor, and all costs due to delays in handling of materials or equipment, and loss or damage, shall be at the expense of the Contractor/Vendor. The Contractor/Vendor shall be responsible for all materials, equipment and supplies sold and delivered to

the City until final inspection of the work and acceptance thereof by the City. In the event any such materials, equipment and supplies are lost, stolen, damaged or destroyed prior to receipt of delivery, Contractor/Vendor shall replace same without cost to the City.

Lands and Right-of-Way: Prior to the start of construction, the City shall obtain all lands and right-of-way necessary for the carrying out and completion of work to be performed under this contract.

Other Prohibited Interests: No official of the City who is authorized in such capacity and on behalf of the City to negotiate; make, accept or approve or to take part in negotiating, making, accepting or approving any architectural, engineering, inspection, construction or material supply contract or any subcontracting connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part hereof. No official who is authorized in such capacity and on behalf of the City to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, insurance contract, or any other contract pertaining to the project.

Construction Schedule and Periodic Estimates: Immediately after execution and delivery of the contract, and before the first partial payment is made, the Contractor/Vendor shall deliver to the City an estimated construction progress schedule in a form satisfactory to the City, showing the proposed dates of commencement and completion of each of the various subdivision of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due to the Contractor/Vendor in accordance with the progress schedule. The Contractor/Vendor shall also furnish on forms mutually agreeable to the Engineer, Contractor/Vendor and the City: (a) a detailed estimate giving a complete breakdown of the contract price, and (b) periodic itemized estimates of work done for the purpose of making partial payments therefore. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

Payments to Contractor/Vendor. (a) At the end of each calendar month during the life of the contract, the contractor/vendor will prepare an estimate of the quantities of the work completed and of the total amount due. The amount will be due on or before the 15th day of the second month following the completion of said work. (b) In preparation of monthly partial pay, estimated accounts may be taken if specifically approved by the owner of materials delivered to the site of work but not yet incorporated into the work. (c) When the work provided for by the contract has been completely performed on the part of the contractor/vendor and all parts of the work have been approved by the engineer and accepted by the owner, a final estimate will be prepared which shows the total cost of the work performed under the contract, including extra work as authorized by change orders, the total amount retained, and the total amount paid on previous partial estimates. All prior estimates upon which payments have been made are subject to necessary corrections or revisions in the final payment. All pay estimates will be reviewed for correctness by the engineer and approved by the owner before payment. NOTE: All payments will be processed by ACH/EFT processing and the contractor will need to be enrolled.

Payments by Contractor/Vendor. The Contractor/Vendor shall pay: (a) for all transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered; and (b) for all materials, tools, and other expendable equipment to the extent of ninety percent (90%) of the cost thereof, not later than the 20th day of the calendar month following that in which such materials, tools, and equipment are delivered at the site of the project, and the balance of the cost thereof, not later than the 30th day following the completion of that part of the work in or on which such materials, tools and equipment are incorporated or used; (c) to each of his subcontractors, not later than the 5th day

following each payment to the Contractor/Vendor, the respective amounts allowed the Contractor/Vendor on account of the work performed by his subcontractors to the extent of each subcontractor's interest.

Acceptance of Final Payment Constitutes Release: The acceptance by the Contractor/Vendor of final payment shall be and shall operate as a release to the City of all claims and all liability to the Contractor/Vendor for all things done or furnished in connection with this work and for every act and neglect of the City and others relating to or arising out of this work. No payment, however, final or otherwise, shall operate to release the Contractor/Vendor or his sureties from any obligations under this contract or the Performance and Payment Bond.

Decisions in Disagreements: The Engineer will be the interpreter of the terms and conditions of the Contract Documents and the judge of the performance thereunder. In his capacity as interpreter and judge, he will exercise his best efforts to ensure faithful performance by both the City and the Contractor/Vendor. He will not show partiality to either and shall not be liable for the result of any interpretation or decision rendered in good faith. Claims, disputes and other matters relating to the

execution and progress of the work or the interpretation of or performance under the Contract Documents shall be referred to the Engineer for decision; which he will render in writing within a reasonable time.

Change Orders: Without invalidating the Agreement, the City may, at any time or from time to time, order additions, deletions, or revisions in the work authorized by an executed, signed Change Order. Change Orders should be submitted on an **AIA Document G701** *(exampled attached in the Forms section of this package)*. Change Orders is a defined written instrument prepared by the Contractor and signed by both Contractor and authorized City representative.

Upon receipt of an executed authorized Change Order, the Contractor/Vendor shall proceed with the work involved. All such work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment will be made.

The RPR may authorize changes or alterations in the work not involving extra cost and not inconsistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order. If the Contractor/Vendor believes that any minor change or alteration authorized by the RPR entitled him to an increase in the Contract Price, he may make a claim in writing.

The Contractor/Vendor shall not start work on any alteration requiring an increase or decrease in price or extension of time until a Change Order setting forth the adjustments is executed by the City.

It is the Contractor's or Vendor's responsibility to notify his Surety of any changes affecting the general scope of the work or change in the Contract Price and the amount of the applicable Bonds shall be adjusted accordingly. The Contractor/Vendor shall furnish proof of such adjustment to the City.

Change of Contract Time: The Contract Time may only be changed by a Change Order. Any claim for an extension in the Contract Time, shall be in writing delivered to the City within five days of the occurrence of the event giving rise to the claim. All claims for adjustment in the Contract Time shall be determined by the Engineer if the City and the Contractor/Vendor cannot otherwise agree. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.

The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of the Contractor if he makes a claim therefore as provided for. Such delays shall include, but not be restricted to, acts or neglect by any separate Contractor/Vendor employed by the City, fires, floods, labor disputes, epidemics, abnormal weather conditions, or acts of God.

All time limits stated in the Contract Documents are of the essence of the Agreement.

Whenever changes in the work are ordered by written Modification, the extension to the Contract Time, if an extension is to be allowed, shall be noted in the same written Modification.

Claims for extension of Contract Time will be approved only if the work or the event which causes the delay, affects the path of critical events of the project. In such case an extension of time will then be allowed only to equal the number of days by which this path of events is lengthened. If required by the Engineer, Contractor/Vendor shall indicate this path of critical events, by diagram or narrative, in such detail as may be necessary to justify his claim and establish the number of days' delay. The path of critical events mentioned herein is defined as that series of interdependent construction events which must be sequentially performed and which require a longer total time to perform than any other such series. Said

extension shall be, as determined by the Engineer, sufficient to compensate for the detention, provided it shall have immediate notice from the Contractor/Vendor, in writing, of the cause and the probable length of the detention; however, neither an extension of any time for any reason beyond the date set herein, nor the acceptance of any work subsequent to said date, shall be deemed a waiver by the City of the right to abrogate the Contract for delay.

Weather Conditions: In the event of temporary suspension of work, or during inclement weather or whenever the Architect/Engineer shall direct, the Contractor/Vendor will and will cause his subcontractors to carefully protect his and their work and materials against damage or inquiry from the weather. If, in the opinion of the Architect/Engineer, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor/Vendor or any of his Subcontractors to protect this work, such materials shall be removed and replaced at the expense of the Contractor/Vendor.

Photographs of the Project. *If required by the Owner, the Contractor/Vendor shall furnish photographs of the project, in the quantities* as requested.

Tests and Inspections: All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Owner. The offer or payment of any compensation, whatever may be its character or form, the offer or giving of any gratuity, or the offer or granting of any valuable favor by the Contractor/Vendor to any Inspection, directly or indirectly, is strictly prohibited, and any such act on the part of the Contractor/Vendor will constitute a violation of this Contract.

If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any work to specifically be inspected, tested, or approved by someone other than the Contractor/Vendor, the Contractor/Vendor shall give the City notice of readiness therefore. The Contractor/Vendor shall furnish the City the required certificates of inspection, testing or approval. All such tests shall be in accordance with the methods prescribed by the American Society for Testing and Materials or such other applicable organization as may be required by law or the Contract Documents. If any such work required so to be inspected, tested or approved is covered without approval of the City, it shall be requested by the City, be uncovered for observation at the Contractor's or Vendor's expense. The cost of such inspections, tests, and approvals shall be borne by the Contractor/Vendor unless otherwise provided.

The City of Zephyrhills shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

Use and Occupancy Prior to Acceptance by City: The Contractor/Vendor agrees to the use and occupancy of a portion or unit of the project before formal acceptance by the City, provided the City:

A. Secures written consent of the Contractor/Vendor except in the event, in the opinion of the Architect/Engineer, the Contractor/Vendor is chargeable with unwarranted delay in final cleanup or punch list items or other contract requirements.
B. Secures endorsement from the insurance-carrier and consent of the Surety permitting occupancy of the building or use of the project during the remaining period of construction.

Acceptance: Upon completion, the project manager shall inspect the project to assure all quality control standards are in compliance with the plans and specifications contained herein. The contract retainage ten (10%) will be released for final payment upon completion of all punch list items.

Guarantee and Warranties: Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the City, shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor/Vendor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The

Contractor/Vendor shall remedy any defect in the work and pay for any damage to other work resulting there from, which shall appear within a period of one (1) year from the date of final acceptance of the work unless a longer period is specified. The City will give notice of observed defects with reasonable promptness.

All guarantees and warranties shall commence on the date of substantial completion or on acceptance by the owner of re-work items. The Contractor shall furnish a one (1) year unconditional warranty. The warranty shall include all manufacturers' warranties on equipment and material installed by the Contractor or any subcontractors. These items shall be transferred to the City and in the City's name. All warranty items shall be secured in an organized 3-ring binder.

City May Stop the Work: If the work is defective, or the Contractor/Vendor fails to supply sufficient skilled workmen or suitable materials or equipment or if the Contractor/Vendor fails to make prompt payments to Subcontractors for labor, materials, or equipment, the City may order the Contractor/Vendor to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the City to stop the work shall not give rise to any duty on the part of the City to exercise this right for the benefit of the Contractor/Vendor or any other party.

For each consecutive calendar day that the work remains incomplete after the date established for final completion, the Contractor/Vendor shall pay City and the City is authorized to retain from the compensation otherwise to be paid to the Contractor/Vendor the sum of the phase schedule, **$1000.00**. This amount is the minimum measure of damages the City will sustain by failure of the Contractor to complete all remedial work, correct deficient work, clean up the project and other miscellaneous tasks as required to complete all work specified. This amount is in addition to the liquidated damages prescribed above, and likewise shall not be construed as a penalty.

The Bidder hereby agrees that the City reserves the right to waive any bid and to reject any or all bids, or to accept any bid that in its judgment will be in the best interest of the City. The bidder's signature understands and acknowledges the requirements set forth in this bid package.

_____ _____

Signature/Print Name/Company Date

In witness whereof, the Bidder has hereunto set his signature and affixed his seal this_____day of_____A.D. 2023

_____ (Seal) By: _____

Title: _____

Scope of Work: The City of Zephyrhills is seeking a contractor to construct a force main and water main along the north side of the City. The project will install approximately 12,500 LF of 6-inch force main along Fort King Road between Phelps Road and Simons Road; then continue east along Kossick Road and terminate near South 301/Gall Blvd. Approximately 3,900 LF of the 6-inch force main will be installed using horizontal directional drilling; the remainder will be installed using open-cut methods. The force main will connect to an existing 8-inch PVC force main along South 301/Gall Blvd.

Continuing on Kossick Road, the 8-inch force main will connect to an existing 6-inch PVC force main near Zephyr Lakes Road and continue east, crossing Wire Road, on Otis Allen Road and connect to the existing 8-inch PVC force main that runs along Otis Allen Road. Approximately 1,100 LF of the 8-inch force main will be installed using horizontal directional drilling; the remainder will be installed using open-cut methods.

The project will install approximately 4,100 LF of 12-inch PVC water main along Kossick Road between Fort King Road and Green Slope Drive. The water main will be installed using open-cut methods, no HDD is proposed. The water main will connect to an existing 12-inch PVC water main on Fort King Road and connect to an existing 12-inch PVC water main on Green Slope Drive. No new residential, commercial, or industrial services will be constructed.

This project is sized to accept future additional flows.

All design constraints will comply with the City's standard design requirements and State of Florida building requirements. Please download the package, plans, and specification for complete details.

Estimated Cost: $4.5 million

Hours of Operation: 7:00 AM – 6:00 PM, Monday – Friday,
Refer to Technical Specifications Section 1.06

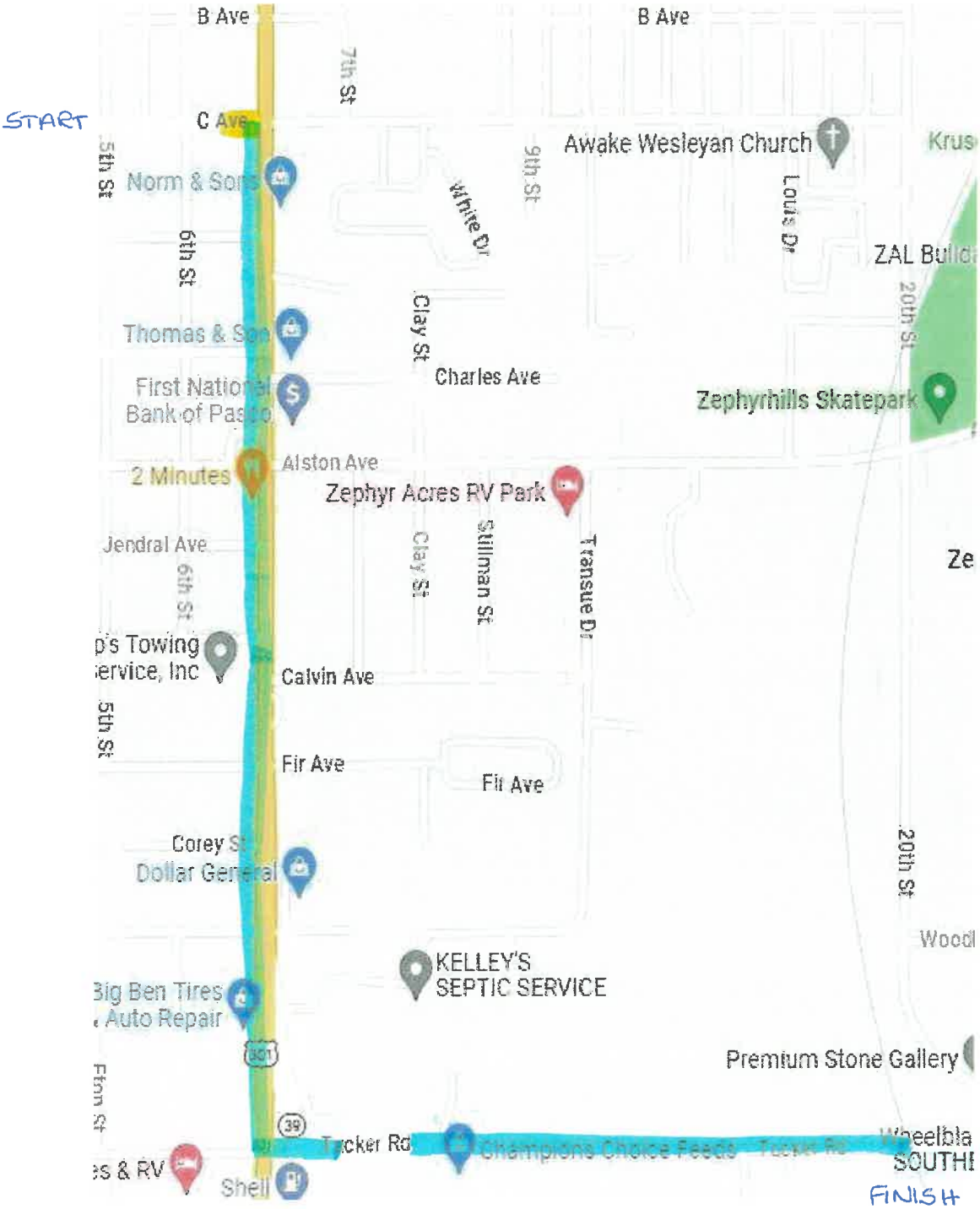
Completion Time: Total estimated project time is about 15 months from Notice to Proceed
Estimated three (3) months for equipment procurement and 12 months
for construction

TelePreConference: Monday, December 4, 2023 or Meet at City Hall-2nd Flr Conf Rm
Link: https://meet.goto.com/159259221
Phone: 1-224-501-3412
Access Code: 159-259-221

This Teleconference will be hosted live at City Hall and via GoTo. Should you attend the meeting in person there will be a visit of the areas.

See next page for location map

Project


START
B Ave
B Ave
7th St
C Ave
5th St
Norm & Sons
6th St
9th St
White Dr
Louis Dr
Awake Wesleyan Church
Krus
ZAL Build
20th St
Clay St
Charles Ave
Thomas & Son
First National Bank of Pasco
Zephyrhills Skatepark
Alston Ave
2 Minutes
Zephyr Acres RV Park
Jendral Ave
6th St
Clay St
Stillman St
Transue Dr
Ze
p's Towing ervice, Inc
Calvin Ave
5th St
Fir Ave
Fir Ave
Corey St
Dollar General
20th St
Woodl
KELLEY'S SEPTIC SERVICE
Big Ben Tires , Auto Repair
301
Premium Stone Gallery
Fitch St
39
Tucker Rd
Champions Choice Feeds
Tucker Rd
Wheelbla
SOUTHI
s & RV
Shell
FINISH

TIME TABLE

Bid Time Table	Date	Day	Time
Bid Distribution	11-20-23	Sunday	
Teleconference Pre-Bid*	12-04-23	Monday	10:00 AM
Equivalent/Question Deadline	12-29-23	Friday	10:00 AM
Response Deadline	01-12-24	Friday	10:00 AM
Presented to City Council	02-12-24	Monday	6:00 PM

*Teleconference: You may need to type the link in manually in order for it to connect.

GoTo Link: https://meet.goto.com/159259221
Phone: +1 (224) 501-3412
Access Code: 159-259-221

This Teleconference will be hosted live at City Hall and via GoTo. Should you attend the meeting in person there will be a visit of the areas.

You may need to type the link into explorer rather than copy/paste.

THE AMERICAN INSTITUTE OF ARCHITECTS

Executed in Counterpart(s)

AIA Document A310

Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we (Here insert full name and address or legal title of Contractor/Vendor)

as Principal, hereinafter called the Principal, and (Here insert full name and address or legal title of Surety)

a corporation duly organized under the laws of the State of
as Surety, hereinafter called the Surety, are held and firmly bound unto
(Here insert full name and address or legal title of Owner)

Bonds and All Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

as Obligee, hereinafter called the Obligee, in the sum of ----------
----------**Dollars ($),**

for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, The Principal has submitted a bid for
(Here insert full name, address and description of project)

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and Sealed this _____ of _____ 2023

_____ ***(Seal)***
(Principal and Title)

_____ ***(Surety Seal)***
(Witness)

_____
(Attorney-in-Fact & Licensed Resident Agent)

SWORN STATEMENT PURSUANT TO SECTION 287.133(3)(a),

FLORIDA STATUTES ON PUBLIC ENTITY CRIMES- ITB-2023-02

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.

A. This sworn statement is submitted to _____
(print name of the public entity)

by_____
(print individual's name and title)

for_____
(print name of entity submitting sworn statement)

whose business address is

_____

_____

and (if applicable) its Federal Employer Identification Number (FEIN) is_____
(If the entity has no FEIN, include the Social ro Number of the individual signing this sworn statement:_____.)

B. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

C. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

D. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes means:

a. A predecessor or successor of a person convicted of a public entity crime; or
b. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

E. I understand that a "person" as defined in Paragraph 287.133(1)(e), Florida Statutes means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or

applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

F. Based on information and belief, the statement which I have marked below is true in relation to the
entity submitting this sworn statement. (Indicate which statement applies.)

_____Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (attach a copy of the final order)

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

_____
(Signature)

Sworn to and subscribed before me this _____ day of
_____, 2023.Personally or known_____
Or Produced identification_____Notary Public – State of _____

_____
My commission expires_____(Type of Identification) _____
(Printed, Typed or stamped commissioned name of notary public)

E-VERIFY CERTIFICATION FORM- ITB 2023-02

All vendors, contractors and subcontractors doing business with the City of Zephyrhills must certify that they have implemented the federal E-Verify program.

E-Verify is a federal system established by the Department of Homeland Security to determine the immigration and work-eligibility status of prospective employees. Detailed E-Verify program information for employers can be found at http://www.dhs.gov/e-verify.

Prior to providing goods or services to the City of Zephyrhills, vendors must certify compliance with the federal E-Verify program. In the case of contractors, this includes obtaining written certification from all subcontractors who will participate in the performance of the contract. The certification below has been prepared for all vendors and contractors to use for this purpose. All subcontractor certifications must be kept on file with the contract vendor and made available to the state and/or City upon request.

CERTIFICATION

(In accordance with Executive Order No. 11-02)

I certify that the company shown below is in compliance with the above statement and that I am authorized to sign on its behalf.

Name of Company: _____

Authorized Signature: _____

Printed Name/Title: _____

Address: _____

Date: _____

Phone: _____

Email: _____

The City of Zephyrhills reserves the right to determine how it will respond to any instances of non-compliance or false certification of compliance. Potential City actions include, but are not limited to, cancellation of the contract and/or suspending or debarring the contract vendor from performing services in any aspect to the City.

Please send the completed form with your submittal.

Addenda Receipt Acknowledgment- ITB 2023-02

Addendum #_____ Date _____ Initials_____

Addendum #_____ Date _____ Initials_____

Addendum #_____ Date _____ Initials_____

Addendum #_____ Date _____ Initials_____

Firm Representative:

_____

Signature/Date **(Executed by Corporate Authority)**

DRUG-FREE WORKPLACE FORM- ITB 2023-02

The undersigned vendor, in accordance with Florida Statute 287.087, hereby

certifies that _____ does:
(Name of Business)

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business' policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or pleas of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm fully complies with the above requirements.

_____
Bidder's Signature

_____
Date

PUR062.036
re. 10/97

NON-COLLUSIVE AFFIDAVIT- ITB 2023-02

State of Florida
County of _____

_____, being first duly sworn, deposes and says that he/she is

_____, the party making the fore-going submittal of qualifications or bid that such submittal
(partner or officer of the Firm, etc)

Or bid is genuine and not collusive or sham; that said Firm has not colluded, conspired, connived or agreed, directly or indirectly, with any Firm or person, to put in a sham response or to refrain from responding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person, to secure any advantage against the City of Zephyrhills of any person interested in the proposed contract; and that all statements in said response are true.

_____
Officer

_____ *(Company Name)*

State of Florida
County of _____

The foregoing instrument was acknowledged before me this _____ day of _____ by
_____ *(name and title of corporate officer)*
of _____ *(Name of Corporation),*
a _____ *(state or place of incorporation)* corporation, on behalf of the corporation. He/she is personally known to me or has produced _____ *(Identification type)* as identification.

_____ *(Signature line for notary public)*

_____ *(Name of notary type, printed or stamped)*

_____ *(Title or rank)*

My commission expires: _____
Serial number, if any _____

Errors or Omissions- ITB 2023-02

Upon review of this project's plans and construction documents are you aware of any apparent errors or omissions?

☐ YES

☐ No

If YES, please provide a detailed explanation of any apparent errors or omissions on this sheet.

Company Representative Date

REFERENCES –PROJECTS OF SIMILAR SCOPE- ITB 2023-02

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 2: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 3: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 4: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

REFERENCES –FOR CURRENTLY ACTIVE PROJECTS- ITB 2023-02

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 2: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 3: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 4: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion Form- ITB 2023-02

1. The prospective Vendor, _____, certifies, by submission of this document, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any Federal Department or Agency.

2. Where the Vendor is unable to certify to the above statement, the prospective Vendor shall attach an explanation to this form.

Vendor: _____
Name of Company – Please Print

Signature: _____
Authorized Company Representative

Name/Title: _____

Address: _____

_____

Date: _____

CITY OF ZEPHYRHILLS

STATEMENT OF NO BID

If you do not intend to bid, please complete the information below and return this form with the bid title and number clearly marked on the front of the envelope. Please send the STATEMENT OF NO BID FORM no later than the opening date indicated on the INVITATION TO BID FORM.

Please be advised that if the NO BID STATEMENT is not executed and returned your name may be deleted from the list of qualified bidders for the City of Zephyrhills.

We decline to submit a bid for the following reasons:

- ❑ Unable to meet Bond or Insurance requirements.
- ❑ Unable to meet specifications; we do not offer this product or an equivalent.
- ❑ Specifications are unclear, specialty items or too intricate.
- ❑ Insufficient time to respond; our schedule will not permit us to perform.
- ❑ Reason for declining on attached sheet.

Company Name: _____Date: _____

Telephone Number: _____Signature: _____

Return completed form to: **City of Zephyrhills, Purchasing Office**
5335 8th Street
Zephyrhills, FL 33542

CERTIFICATION OF CONTRACTOR REGARDING TRENCH SAFETY- ITB 2023-02

This certification is required pursuant to the Trench Safety Act, Chapter 90-98, Florida Statutes regarding Trench Safety. The Act specifically incorporates the Occupational Safety and Health Administration's excavation safety standards, 29 CFR S. 1928.650 Subpart P as the State standard. Any revision to OSHA's safety standards that are consistent with the Florida Statues shall also be complied with upon its effective date. The act requires that any bidder or prospective contractor, or any of their proposed subcontractors, shall provide written assurance that the contractor will comply with the applicable trench safety standards.

Name of Contractor: _____

Address: _____

_____

Phone: _____

1. Contractor agrees that he is aware of the Trench Safety Act and the requirements of the Act.
2. Contractors agrees to comply with all applicable trench safety standards as set forth in the Act and as referenced in the Act.

Name of Signer: _____
PLEASE PRINT

Title: _____

Signature: _____

Date: _____

AIA® Document G701™ – 2017

Change Order

PROJECT: *(name and address)*	CONTRACT INFORMATION: Contract For: Date:	CHANGE ORDER INFORMATION: Change Order Number: Date:
OWNER: *(name and address)*	ARCHITECT: *(name and address)*	CONTRACTOR: *(name and address)*

THE CONTRACT IS CHANGED AS FOLLOWS:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)

The original (Contract Sum) (Guaranteed Maximum Price) was	$ _____
The net change by previously authorized Change Orders	$ _____
The (Contract Sum) (Guaranteed Maximum Price) prior to this Change Order was	$ _____
The (Contract Sum) (Guaranteed Maximum Price) will be (increased) (decreased) (unchanged) by this Change Order in the amount of	$ _____
The new (Contract Sum) (Guaranteed Maximum Price), including this Change Order, will be	$ _____
The Contract Time will be (increased) (decreased) (unchanged) by	( ) days.
The new date of Substantial Completion will be	

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

ARCHITECT *(Firm name)*	CONTRACTOR *(Firm name)*	OWNER *(Firm name)*
SIGNATURE	SIGNATURE	SIGNATURE
PRINTED NAME AND TITLE	PRINTED NAME AND TITLE	PRINTED NAME AND TITLE
DATE	DATE	DATE

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Sample

NORTHSIDE PHASE 3 FORCE MAIN/WATER LINE EXTENSION

BID DOCUMENTS
AND
TECHNICAL SPECIFICATIONS

Project No. 26110-053-01

Owner:

CITY OF ZEPHYRHILLS
5335 8th Street
Zephyrhills, Florida 33542



Engineer:

JONES EDMUNDS & ASSOCIATES, INC.
3910 S. Washington Avenue, Suite 210
Titusville, Florida 32780

November 2023

CITY OF ZEPHYRHILLS
NORTHSIDE PHASE 3 FORCE MAIN/WATER LINE EXTENSION
TECHNICAL SPECIFICATIONS

Kenneth A Fraser

Digitally signed by Kenneth A Fraser
Date: 2023.11.08 13:28:40 -05'00'

Kenneth Acie Fraser, PE, Florida Professional Engineer No. PE57452
This item has been digitally signed and sealed by Kenneth Acie Fraser, PE, on the date indicated here. Printed copies of this document are not considered signed and sealed. The signature must be verified on any electronic copies. The above-named Professional Engineer shall be responsible for the following Divisions in accordance with Rule 61G15-23.004, FAC:
Divisions 1, 2, 3, 5, 9, 15
Jones Edmunds & Associates, Inc.

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BID FORM

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01325 CONSTRUCTION PHOTOGRAPHS
01330 SUBMITTALS AND ACCEPTANCE
01350 ENVIRONMENTAL PROTECTION PROCEDURES
01355 SPECIAL PROVISIONS
01400 QUALITY REQUIREMENTS
01450 TESTING AND TESTING LABORATORY SERVICES
01500 TEMPORARY FACILITIES AND CONTROLS
01600 MATERIALS AND EQUIPMENT
01650 DELIVERY, STORAGE, AND HANDLING
01720 FIELD ENGINEERING
01740 FINAL CLEANING
01770 PROJECT CLOSEOUT
01780 WARRANTIES AND BONDS
01785 RECORD DOCUMENTS
01830 OPERATIONS AND MAINTENANCE MANUALS

DIVISION 2—SITE CONSTRUCTION

02000 REFERENCED FDOT SPECIFICATIONS
02230 SITE PREPARATION
02240 DEWATERING
02300 EARTHWORK FOR STRUCTURES
02305 EARTHWORK FOR UTILITIES
02370 EROSION AND SEDIMENTATION CONTROL
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03301 CONCRETE AND REINFORCING STEEL
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05500 METAL FABRICATIONS

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15055 PIPING SYSTEMS—GENERAL
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15075 PROCESSS EQUIPMENT, PIPING, AND VALVE IDENTIFICATION
15110 MANUAL, CHECK, AND PROCESS VALVES
15121 MISCELLANEOUS PIPE FITTINGS AND ACCESSORIES
15125 PIPING APPURTENANCES
15141 DISINFECTION OF PIPING AND WATER STORAGE FACILITIES
15144 PRESSURE TESTING OF PIPING
15146 HIGH-DENSITY POLYETHYLENE (HDPE) PIPE
15155 DUCTILE IRON PIPE AND FITTINGS
15291 POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND FITTINGS

APPENDICES

APPENDIX A REPORT OF A GEOTECHNICAL SITE EXPLORATION

APPENDIX B PERMITS:
1. PASCO COUNTY RIGHT OF WAY USE
2. FDOT RIGHT OF WAY USE
3. FDEP POTABLE WATER MAIN EXTENSION
4. FDEP WASTEWATER COLLECTION/TRANSMISSION SYSTEM
5. FDEP ERP FOR UTILITY INSTALLATION

DIVISION 0

BIDDING AND CONTRACTING REQUIREMENTS

CITY OF ZEPHYRHILLS
FRONT-END DOCUMENTATION

CITY OF ZEPHYRHILLS

Northside Phase 3 Force Main/Water Line Extension

CONSTRUCTION ITEMIZED PRICING SHEET

Item No.	Item Description	Qty.	Unit	Unit Price	Amount
BASE BID					
1	Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions	1	LS		
2	Traffic Control	1	LS		
3	Environmental Protection	1	LS		
4	Construction Survey and Layout	1	LS		
5	6-Inch, 8-Inch Sanitary Sewer Force Main via Open-Cut	12,978	LF		
6	6-Inch, 8-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	5,000	LF		
7	12-Inch Potable Water Main via Open-Cut	4,100	LF		
8	Combination Air/Vacuum Valves and Vaults	14	EA		
9	Concrete Restoration	2,525	SY		
10	Limerock Restoration	50	SY		
11	Asphalt Concrete Restoration	220	SY		
12	Testing Allowance	1	AL		
13	Record Drawings Allowance	1	AL		
	TOTAL BID PRICE				

DIVISION 1

GENERAL REQUIREMENTS

SECTION 01000
PROJECT REQUIREMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Work to be done consists of the furnishing of all labor, materials, and equipment and the performance of all Work included in this Contract. The summary of the Work is presented in Section 01100, Summary of Work.

B. Work Included

1. The Contractor shall furnish all labor, superintendence, materials, plant power, light, heat, fuel, water, tools, appliances, equipment, supplies, and means of construction necessary for proper performance and completion of the Work. The Contractor shall obtain and pay for all necessary local building permits. The Contractor shall perform and complete the Work in the manner best calculated to promote rapid construction consistent with safety of life and property and to the satisfaction of the Engineer and in strict accordance with the Contract Documents. The Contractor shall clean up the Work and maintain it during and after construction, until accepted, and shall do all Work and pay all costs incidental thereto. He shall repair or restore all structures and property that may be damaged or disturbed during performance of the Work.
2. The cost of incidental work described in these Project Requirements for which there are no specific Contract Items shall be considered as part of the general cost of doing the Work and shall be included in the prices for the various Contract Items. No additional payment will be made therefor.
3. The Contractor shall provide and maintain such modern plant, tools, and equipment as may be necessary, in the opinion of the Engineer, to perform in a satisfactory and acceptable manner all the Work required by this Contract. Only equipment of established reputation and proven efficiency shall be used. The Contractor shall be solely responsible for the adequacy of his workmanship, materials, and equipment, prior approval of the Engineer notwithstanding.

C. Public Utility Installations and Structures

Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, vaults, manholes, and all other appurtenances and facilities pertaining thereto whether owned or controlled by the Owner, other governmental bodies, or privately owned by individuals, firms, or corporations

used to serve the public with transportation, traffic control, gas, electricity, telephone, sewerage, drainage, water, or other public or private property which may be affected by the Work shall be deemed included hereunder.

1. The Contract Documents contain data relative to existing public utility installations and structures above and below the ground surface. These data are not guaranteed as to their completeness or accuracy and it is the responsibility of the Contractor to make his own investigations to inform himself fully of the character, condition, and extent of all such installations and structures as may be encountered and as may affect the construction operations.
2. The Contractor shall protect all public utility installations and structures from damage during the Work. Access across any buried public utility installation or structure shall be made to avoid any damage to these facilities. All required protective devices and construction shall be provided by the Contractor at his expense. All existing public utilities damaged by the Contractor shall be repaired by the Contractor, at his expense. No separate payment shall be made for such protection or repairs to public utility installations or structures.
3. Public utility installations or structures owned or controlled by the Owner or other governmental body which are shown on the Drawings to be removed, relocated, replaced, or rebuilt by the Contractor shall be considered as a part of the general cost of doing the Work and shall be included in the prices bid for the various Contract Items. No separate payment shall be made therefor.
4. Where public utility installations of structures owned or controlled by the Owner or other governmental body are encountered during the Work and are not indicated on the Drawings or in the Specifications, and when, in the opinion of the Engineer, removal, relocation, replacement, or rebuilding is necessary to complete the Work under this Contract, such Work shall be accomplished by the utility having jurisdiction, or such Work may be ordered, in writing by the Engineer, for the Contractor to accomplish. If such work is accomplished by the utility having jurisdiction it will be carried out expeditiously, and the Contractor shall give full cooperation to permit the utility to complete the removal, relocation, replacement, or rebuilding as required. If such work is accomplished by the Contractor, it will be paid for as extra work as provided in the Agreement.
5. At all times in performance of the Work the Contractor shall employ acceptable methods and exercise reasonable care and skill so as to avoid unnecessary delay, injury, damage, or destruction of public utility installations and structures and shall at all times in the performance of the Work avoid unnecessary interference with or interruption of public utility services and cooperate fully with the owners thereof to that end.

6. The Contractor shall give written notice to the Owner and other governmental utility departments and other owners of public utilities of the location of his proposed construction operations at least 48 hours in advance of breaking ground in any area or on any unit of the Work.
7. The maintenance, repair, removal, relocation, or rebuilding of public utility installations and structures, when accomplished by the Contractor as herein provided, shall be done by methods approved by the owners of such utilities.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 DRAWINGS AND PROJECT MANUAL

A. Drawings: When obtaining data and information from the Drawings, figures shall be used in preference to scaled dimensions and large-scale drawings in preference to small-scale drawings.

B. Supplementary Drawings

1. When, in the opinion of the Engineer, it becomes necessary to explain more fully the Work to be done or to illustrate the Work further or to show any changes which may be required, the Engineer will prepare drawings known as Supplementary Drawings, with specifications pertaining to such Drawings, and the Contractor will be furnished one complete set of reproducible black line prints (24 inches by 36 inches) and one reproducible copy of the specifications.
2. The Supplementary Drawings shall be binding upon the Contractor with the same force as the Contract Drawings. Where such Supplementary Drawings require either less or more than the estimated quantities of Work, credit to the Owner or compensation therefor to the Contractor shall be subject to the terms of the Agreement.

C. Contractor to Check Drawings and Data

1. The Contractor shall verify all dimensions, quantities, and details shown on the Drawings, Supplementary Drawings, Schedules, Specifications, or other data received from the Engineer, and shall notify the Engineer of all errors, omissions, conflicts, and discrepancies found therein. Failure to discover or correct errors, conflicts, or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory work, faulty construction, or improper operation resulting therefrom, nor from rectifying such conditions at his own expense. He will not be allowed to take advantage of any errors or omissions, as full instructions will be furnished by the Engineer should such errors or omissions be discovered.
2. All schedules are given for the convenience of the Engineer and the Contractor and are not guaranteed to be complete. The Contractor shall assume all responsibility or the making of estimates of the size, kind, and quality of materials and equipment included in Work to be done under the Contract.

D. Specifications: The Technical Specifications each consist of three parts: General, Products, and Execution. The General part of a Specification contains General Requirements which govern the Work. The Products and Execution parts modify and supplement the General Requirements by detailed requirements for the Work and shall always govern whenever there appears to be a conflict.

E. Intent

1. All Work called for in the Specifications applicable to this Contract, but not shown on the Drawings in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified in either the Drawings or in the Specifications but involved in carrying out their intent or in the complete and proper execution of the Work is required and shall be performed by the Contractor as though it were specifically delineated or described.
2. The apparent silence of the Specifications as to any detail or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used. The interpretation of these Specifications shall be made upon that basis.

1.05 MATERIALS AND EQUIPMENT

A. Manufacturer

1. All transactions with the manufacturers or subcontractors shall be through the Contractor unless the Contractor shall request and at the Engineer's option that the manufacturer or subcontractor deal directly with the Engineer. Any such transactions shall not in any way release the Contractor from his full responsibility under this Contract.
2. Any two or more pieces of material or equipment of the same kind, type, or classification, and being used for identical types of service, shall be made by the same manufacturer.

B. Delivery

1. The Contractor shall deliver materials in ample quantities to ensure the most speedy and uninterrupted progress of the Work so as to complete the Work within the allotted time.
2. The Contractor shall also coordinate deliveries in order to avoid delay in or impediment of the progress of the work of any related Contractor.

C. Tools and Accessories

1. Unless otherwise stated in the Contract Documents, the Contractor shall furnish with each type, kind, or size of equipment, one complete set of suitably marked high-grade special tools and appliances which may be needed to adjust, operate, maintain, or repair the equipment. Such tools and appliances shall be furnished in approved painted steel cases, properly labeled and equipped with good-grade cylinder locks and duplicate keys.
2. Spare parts shall be furnished as specified herein and as recommended by the manufacturer necessary for the operation of the equipment, not including materials required for routine maintenance.
3. Each piece of equipment shall be provided with a substantial nameplate, securely fastened in place, and clearly inscribed with the manufacturer's name, year of manufacture, serial number, weight, and principal rate data.

D. Service of Manufacturer's Engineer

1. The Contract Prices for equipment shall include the cost of furnishing a competent and experienced engineer or superintendent who shall represent the manufacturer and shall help the Contractor, when required, install, adjust, test, and place in operation the equipment in conformity with the Contract Documents.

2. After the equipment is placed in permanent operation by the Owner, the engineer or superintendent shall make all adjustments and tests required by the Engineer to prove that the equipment is in proper and satisfactory operating condition and shall instruct such personnel as may be designated by the Owner in the proper operation and maintenance of such equipment.

1.06 INSPECTION AND TESTING

A. General

1. For tests specified to be made by the Contractor, the testing personnel shall make the necessary inspections and tests, and the reports thereof shall be in such form as will facilitate checking to determine compliance with the Contract Documents. Five copies of the reports shall be submitted and authoritative certification thereof must be furnished to the Engineer as a prerequisite for the acceptance of any material or equipment.
2. If, in the making of any test of any material or equipment, the Engineer ascertains that the material or equipment does not comply with the Contract Documents, the Contractor will be notified thereof and he will be directed to refrain from delivering said material or equipment, or to remove it promptly from the site or from the Work and replace it with acceptable material without cost to the Owner.
3. Tests of electrical and mechanical equipment and appliances shall be conducted in accordance with the recognized test codes of the ANSI, ASME, or the IEEE, except as may otherwise be stated herein.
4. The Contractor shall be fully responsible for the proper operation of equipment during testing and instruction periods and shall neither have nor make any claim for damage which may occur to equipment before the time when the Owner formally takes over the operation thereof.

B. Costs

1. The Contractor shall provide all inspection and testing of materials furnished under this Contract, unless otherwise expressly specified.
2. The Contractor shall bear the cost of shop and field tests of equipment and of certain other tests specifically called for in the Contract Documents, and such costs shall be deemed to be included in the Contract Price.
3. The Owner may test materials and equipment submitted by the Contractor as the equivalent to those specifically named in the Contract for compliance. The Contractor shall reimburse the Owner for the expenditures incurred in making such tests of materials and equipment which are rejected for non-compliance.

C. Certificate of Manufacture

1. The Contractor shall furnish the Engineer with authoritative evidence in the form of a certificate of manufacture that the materials to be used in the Work have been manufactured and tested in conformity with the Contract Documents.
2. These certificates shall be notarized and shall include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product or on similar products of the manufacturer.

D. Shop Tests

1. Each piece of equipment for which pressure, duty, capacity, rating, efficiency, performance, function, or special requirements are specified shall be tested in the shop of the maker in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents.
2. Five copies of the manufacturer's actual test data and interpreted results thereof, accompanied by a certificate of authenticity sworn to by a responsible official of the manufacturing company and/or independent laboratory, shall be submitted to the Engineer for approval.
3. The Contractor shall bear the cost of shop tests and of furnishing manufacturer's preliminary and shop test data of operating equipment.

E. Start-up Tests

1. As soon as conditions permit, the Contractor shall furnish all labor, materials, and instruments and shall make start-up tests of equipment.
2. If the start-up tests disclose any equipment furnished under this Contract which does not comply with the requirements of the Contract Documents, the Contractor shall, before demonstration tests, make all changes, adjustments, and replacements required. The furnishing contractor shall assist in the start-up tests as applicable.

F. Demonstration Tests

1. Before the Contractor's request for a Substantial Completion inspection, all equipment and piping installed under this Contract shall be subjected to demonstration tests as specified or required to prove compliance with the Contract Documents.
2. The Contractor shall furnish labor, fuel, energy, water, and all other materials, equipment, and instruments necessary for all demonstration tests at no additional cost to the Owner. The Contractor shall assist in the demonstration tests as applicable.

1.07 LINES AND GRADES

A. Grade

1. All work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings or as given by the Engineer. The full responsibility for keeping alignment and grade shall rest upon the Contractor.
2. The Engineer will establish bench marks and provide coordination points. Reference marks for lines and grades as the Work progresses will be located by the Contractor to cause as little inconvenience to the prosecution of the Work as possible. The Contractor shall place excavation and other materials so as to cause no inconvenience in the use of the reference marks provided. He shall remove any obstructions he places contrary to this provision.

B. Surveys

1. At his own expense, the Contractor shall furnish and maintain stakes and other such materials.
2. The Contractor shall check such reference marks by such means as he may deem necessary and, before using them, shall call the Engineer's attention to any inaccuracies.
3. At his own expense, the Contractor shall establish all working or construction lines and grades as required from the reference marks set by the Engineer and shall be solely responsible for the accuracy of these lines and grades. He shall, however, be subject to check and review by the Engineer.

C. Safeguarding Marks

1. The Contractor shall safeguard all points, stakes, grade marks, monuments, and bench marks made or established on the Work, bear the cost of re-establishing them if disturbed, and bear the entire expense of rectifying work improperly installed due to not maintaining or protecting or to removing without authorization such established points, stakes, and marks.
2. The Contractor shall safeguard all existing and known property corners, monuments, and marks adjacent to but not related to the Work and shall bear the cost of re-establishing them if they are disturbed or destroyed.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01100
SUMMARY OF WORK

PART 1 GENERAL

1.01 SCOPE OF WORK

Unless otherwise expressly provided in the Contract Documents, the Work must be performed in accordance with best modern practice, with materials and workmanship of the highest quality to the satisfaction of the Owner.

A. The Project title is:

Northside Phase 3 Force Main/Water Line Extension
City of Zephyrhills, Pasco County, Florida
Jones Edmunds Project No. 26110-053-01

B. The Work of this Project includes:

1. Installing approximately 6,000 linear feet (LF) of 6-inch sanitary sewer force main beginning at C Avenue on Gall Boulevard turning onto Tucker Road and ending west of the railroad tracks. Approximately 4,600 LF of the force main will be installed using horizontal directional drilling (HDD); the remainder will be installed using open-cut methods.
2. Installing approximately 3,000 LF of 12-inch potable water main along Gall Boulevard between Alston Avenue and Tucker Road. Approximately 2,700 LF of the potable water main will be installed using HDD; the remainder will be installed using open-cut methods.
3. Project restoration will include repairing pavement, re-sodding of affected areas, and replacing concrete curb/gutter and sidewalk.

C. The Specification divisions and Drawings are an integrated part of the Contract Documents and, as such, will not stand alone if used independently as individual sections, divisions, or drawing sheets. The Drawings and Specifications establish minimum standards of quality for this project. They do not purport to cover all details entering into the design and construction of materials and equipment.

1.02 REFERENCE STANDARDS

Reference standards and recommended practices referred to herein shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Association of State Highway and Transportation Officials (AASHTO) Formerly (AASHO)
B. American Concrete Institute (ACI)
C. American Institute of Steel Construction (AISC)
D. American Iron and Steel Institute (AISI)
E. American National Standards Institute (ANSI)
F. American Standards Association (ASA)
G. American Society of Mechanical Engineers (ASME)
H. American Society of Testing and Material (ASTM)
I. American Water Works Association (AWWA)
J. American Welding Society (AWS)
K. Anti-Friction Bearing Manufacturer's Association (AFBMA)
L. Building Officials and Code Administrators International, Inc. (BOCA)
M. Construction Specifications Institute (CSI)
N. Federal Specification (FS)
O. Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction, Latest English Edition (Standard Specifications)
P. FDOT Roadway and Traffic Design Standards Latest English Edition (FDOT Index)
Q. Geosynthetics Institute (GSI)
R. National Bureau of Standards (NBS)
S. National Electrical Manufacturer's Association (NEMA)
T. National Fire Protection Association (NFPA)
U. Portland Cement Association (PCA)
V. Occupational Safety and Health Act (Public Law 91-596), U.S. Department of Labor (OSHA)
W. Steel Structures Painting Council (SSPC)
X. Southern Standard Building Code (SSBC)
Y. Underwriters' Laboratories, Inc. (UL)
Z. United States of America Standards Institute (USASI)
AA. Regulations of Florida Industrial Commission Regarding Safety
BB. All local, state, county, or municipal building codes requirements of the Owner's Insurance

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.05 GENERAL REQUIREMENTS

A. Unless otherwise specified on the Construction Drawings or Specifications, all work and the quality of materials shall conform to the referenced sections of the Florida Department of Transportation (FDOT) *Standard Specifications for Road and Bridge Construction, Supplementary Specifications*, and *Roadway and Traffic Design Standards*. The Contractor shall retain on the job site copies of these standard FDOT documents. The basis of payment shall conform to Section 01200, Measurement and Payment, of the General Requirements.

1.06 WORKING HOURS

A. Work under this contract shall not be prosecuted on Saturdays, Sundays or on State and/or National holidays, except in time of emergency, and then only under written permission from the Owner who shall be the sole judge as to the urgency of that situation. On weekdays the workday shall be limited to daylight hours.

B. If the Contractor deems it necessary to work on Sundays, holidays, or beyond daylight hours to comply with his construction schedule or because of an emergency, the Contractor shall request permission of the Owner to do so. If, in the opinion of the Owner, the need is bona fide, the Owner will authorize the Contractor to work such hours as may be necessary.

1.07 REIMBURSEMENT FEES

A. The following rates shall be applied as the Owner's reimbursement of the Engineer's fee to be paid by the Contractor for expenses defined in Supplementary Conditions SC-6.02.C, SC-6.05.A.2.f, SC-6.17.E.2, SC-9.05.B, and SC-13.03.A.

1.	Field Representative (Construction):	$125.00
2.	Construction Administrator:	$155.00
3.	Engineering Consultant (Project Manager):	$200.00
4.	Engineering Consultant (Chief Engineer):	$265.00
5.	CADD/Designer:	$125.00
6.	Administrative Assistant:	$ 80.00

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01200
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers methods of measurement and payment for items of work under this Contract.

B. The total Contract Price shall cover all work required by the Contract Documents. All cost in connection with the proper and successful completion of the work, including furnishing all materials, equipment, and tools and performing all necessary labor and supervision to fully complete the work, shall be included in the unit price and lump-sum Bid prices. All work not specifically set forth as a pay item in the Bid Form or Bid Schedule shall be considered a subsidiary/ ancillary obligation of the Contractor and all costs in connection with these subsidiary/ancillary obligations shall be included in the Bid(s) to provide a complete and functional Project.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 EXCAVATION, TRENCHING, AND CLEARING

A. Except where otherwise specified, the unit price or lump-sum price bid for each item of work which involves excavation, trenching, clearing, grubbing, or disposal of cleared and grubbed materials shall include all costs for such work. No direct payment shall be made for clearing, grubbing, disposal of cleared or grubbed materials, excavation, trenching, disposal of surplus excavated material, handling water (and groundwater) and purchasing and hauling of required fill material. All excavation and trenching shall be unclassified as to materials which may be encountered; in addition, trenches shall be unclassified as to depth, unless otherwise stated.

1.05 LUMP SUM

A. For lump-sum items, payments shall be made to the Contractor in accordance with an accepted Progress Schedule of Values on the basis of actual work completed and accepted by the Owner at the final completion of the Project.

1.06 UNIT PRICE

A. For unit price items, payment shall be made based on the actual amount of work accepted by the Owner and for the actual amount of materials in place at the final completion of the Project, as confirmed by the final measurements.

B. After the work is completed and before final payment is made, the Engineer will make final measurements, with all required assistance from the Contractor, to determine the quantities of various items of work accepted as the basis for the final unit price payment.

1.07 PAYMENT FOR INCREASED OR DECREASED QUANTITIES

A. When alterations in the quantities of unit price work not requiring a Change Order(s), as herein provided for, are ordered and performed, the Contractor shall accept payment in full at the Contract unit price multiplied by the actual quantities of work constructed and accepted by the Owner at the completion of the project.

B. The actual percentage of each lump sum bid item completed by the Contractor and accepted by the Owner at the final completion of the Project will be paid to the Contractor.

1.08 DELETED ITEMS

A. Should any items contained in the Bid Schedule(s) be found unnecessary for the proper completion of the work contracted, the Engineer may eliminate such items from the Contract. This action shall in no way invalidate the Contract and no financial allowance or compensating payment for anticipated profit, overhead, etc., will be made for items so eliminated in making final payment to the Contractor.

1.09 PARTIAL PAYMENTS

A. Partial payments shall be made monthly as the work progresses. Partial payment shall be made subject to the provisions of the General and Supplementary Conditions.

1.10 PAYMENT FOR STORED MATERIAL DELIVERED TO THE PROJECT

A. When requested by the Contractor and at the discretion of the Owner, payment may be made for all or part of the value of acceptable materials and equipment to be incorporated into bid items, which have not been used, and which have been delivered to the construction site or placed in storage places acceptable to the Owner. The Contractor shall provide receipts for all stored material items requested for reimbursement which clearly identify the stored material item, where it is to be constructed, the unit cost of the item, as well as the total cost of the delivered item(s), the quantity of the item, the brand name of the item, and the supplier. Note that there are additional documentation requirements and storage requirements within the Contract Documents that must also be met before the Contractor can be reimbursed for these stored materials.

B. No payment shall be made for fuels, supplies, installation or connection hardware, lumber, false work, or other similar materials or on temporary structures or other work (items) of any kind which are not a permanent part of the Contract. Items having a value of less than $2,500 shall not be compensated for as a stored material item.

1.11 FINAL PAYMENT

A. If requested by the Engineer, the Contractor shall field verify all quantities in dispute by using visual observation, taped measurements, or other methods designated by the Engineer. The field verification shall be made in the presence of the Engineer and agreed to by both the Engineer and the Contractor. The Engineer will prepare a final adjusting Change Order which will adjust the final quantities of the project Bid Schedule to reflect the actual work accepted by the Owner and for which the Contractor will be compensated.

1.12 SCHEDULE OF VALUES

A. A schedule of values for the lump-sum bid items and some of the unit price bid items as required by the Engineer shall be submitted and accepted before the first pay request is approved by the Engineer. The schedule of values shall be based on the prices bid in the Bid Schedule(s). Prices bid in the Bid Schedule(s) cannot be changed in the schedule of values; they can only be broken down into more detail so that the Engineer can more accurately review and approve the Contractor’s pay application for the completed work.

1.13 MISCELLANEOUS CONSTRUCTION ITEMS

A. When pipe/service lines are constructed across a road, the road shall not be cut to perform this construction unless authorized in writing by the Engineer. Service

lines are to be bored, jack and bored, or horizontally directionally drilled (HDD) under the road. Jetting of water lines or water service lines will not be allowed.

B. The Contractor shall take all precautions necessary to protect existing utilities, roads, and miscellaneous items from damage during construction.

C. The Contractor shall repair, relocate, or replace existing utilities, roadways, and miscellaneous items to pre-construction conditions.

D. All repairs, relocations, and replacements necessary are considered incidental to the work and will be at the Contractor's cost, with no cost to the Owner.

E. The unit-price bid items and lump-sum bid items for all pipe items shall constitute full compensation for furnishing, laying, jointing, and testing of pipe; dewatering; excavation and backfill; and cleanup. All pipe lines, including but not limited to water lines, force mains, and gravity sewer lines, which are to be paid for per linear foot in the Bid Schedule, will be measured for payment only on a horizontal plane after installation, unless otherwise noted.

F. Payment for the water services, fire hydrants, and isolation valve bid items shall not be made until the associated Water Service Cards, Fire Hydrant Cards, and Isolation Valve Cards have been properly filled out, signed by the Contractor, and accepted by the Engineer as completed installations. Samples of the Water Service Card, Fire Hydrant Card, and Isolation Valve Card are located at the end of Specification Section 15110, Manual, Check, and Process Valves. The Contractor shall make all required copies of the cards for use in the work.

G. The Contractor shall have the City observe and document the installation of each underground fitting on the project. If the installation of any fitting is not confirmed and documented by the City, it shall not be paid for by the Owner.

PART 2 PAY ITEM DESCRIPTIONS

2.01 BID – NORTHSIDE PHASE 3 FORCE MAIN/WATER LINE EXTENSION

The descriptions provided in the following Paragraphs are to be used by the Bidder in preparing the Bid Schedule(s). They generally indicate how the major workscope items and their respective costs are to be separated into the line items listed in the Bid Schedule(s). These descriptions are not fully representative nor all-inclusive of the work required to complete the project in accordance with the Contract Documents. It is the Bidder's responsibility to include all required costs within the most appropriate line item(s).

BASE BID

Item 1. Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions (not to exceed 5% of the Base Bid)—This item shall include and cover the costs for performing construction; preparatory and overhead operations including but not limited to movement of personnel and equipment to and from the site; sanitary facilities; project administration and management; insurance; Owner and Engineer indemnification; temporary utilities; permits related to construction; performance and payment bonds in accordance with Florida Statutes 225.05; site safety and health program during the execution of the Construction Contract that complies with all local, state, and federal safety guidelines and laws; and all other similar activities and facilities necessary for executing this project. This lump-sum item shall not exceed 5% of the Base Bid amount. The Contractor will be paid 20% of this item upon completion of mobilization and 10% upon demobilization; the remainder will be prorated equally over the construction period.

Item 2. Traffic Control—The Contractor shall furnish all labor, signage, barricades, and other equipment necessary to provide traffic control in accordance with the Florida Department of Transportation (FDOT) Standard Specifications for all phases of work and all other maintenance of traffic plans as may be required by local, county, or state agencies. The Contractor will be paid 40% of this lump-sum item upon delivery and set up of the materials, and the remainder will be prorated equally over the construction duration.

Item 3. Environmental Protection—This item shall include but not be limited to all costs for providing a comprehensive environmental protection program for the project site and other areas as may be affected by the construction. This includes providing labor and materials necessary to prevent environmental damage to the ground, water, and air in conformance with all local, state, and federal laws. Examples include control of stormwater, erodible soils, noise, dust, pollutants, trash, waste, pumping discharge, and any other substance or activity that may adversely impact the environment. The Contractor will be paid 40% upon delivery and set up of the materials, and the remainder will be prorated equally over the construction period.

Item 4. Construction Survey and Layout—This item shall include all costs for providing the services of a Professional Land Surveyor to perform pre-construction stakeout; establish vertical control; and establish horizontal control, right-of-way locations, property boundary locations, and Record Drawing information verification and certification in accordance with the Contract Documents and to the satisfaction of the Owner. The Contractor will be paid 40% of this lump-sum item upon initial project layout, and the remainder will be prorated equally over the duration of construction.

Item 5. 6-Inch Sanitary Sewer Force Main via Open-Cut—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 6-inch sanitary sewer force mains installed by open cut as shown on the Drawings in accordance with the Contract Documents, including but not limited to all polyvinyl chloride (PVC) pipe, ductile iron (DI) pipe, DI fittings and connections, pipe restraints, end plugs, tracing wire, flushing of all

lines, connections, excavation, backfill, compaction, sodding/seeding, pressure testing, all associated appurtenances, and any other incidentals necessary for a complete and operable system as designed. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 6. 6-Inch Sanitary Sewer Force Main via Horizontal Directional Drilling (HDD)—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 6-inch sanitary sewer force main via HDD as shown on the Drawings in accordance with the Contract Documents, including but not limited to bore pits, piping, boring, reaming, back-reaming, slurry, slurry relief holes, installing the pipe in the bore, connections and transition couplings, high-density polyethylene (HDPE) reducers, HDPE fittings, removing or avoiding obstructions in the path of the HDPE pipe, existing utility coordination and relocation, excavation, backfill, compaction, sodding/seeding, site restoration, pressure testing, disinfection, disposal of soil (including disposal of soil/slurry mixture), and all associated appurtenances. Concrete, asphalt, or limerock repairs required specifically for the HDD installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 7. 12-Inch Potable Water Main via Open-Cut—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 12-inch potable water main via open-cut as shown on the Drawings in accordance with the Contract Documents, including but not limited to all PVC pipe, DI fittings and connections, pipe restraints, end plugs, fire hydrants, tracing wire, flushing of all lines, connections, excavation, backfill, compaction, sodding/seeding, landscape restoration, mailbox and other improvements restoration, existing utility coordination and relocation, pressure testing, bacteriological testing, all associated appurtenances, and any other incidentals necessary for a complete and operable system as designed. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe. No deduction in length will be made for the space occupied by valves or fittings. Concrete, asphalt, or limerock repairs required specifically for the open-cut water main installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid on a unit-price basis for each linear foot of water main installed complete as measured in place.

Item 8. 12-Inch Potable Water Main via HDD—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 12-inch potable water main via HDD as shown on the Drawings in accordance with the Contract Documents, including but not limited to bore pits, piping, bore, reaming, back-reaming, slurry, slurry relief holes, installing the pipe in the bore, connections and transition couplings, HDPE reducers, HDPE fittings, removing or avoiding obstructions in the path of the HDPE pipe, existing utility coordination and relocation, excavation, backfill, compaction, sodding/seeding, site restoration, pressure testing, disinfection, disposal of soil (including disposal of soil/slurry

mixture), and all associated appurtenances. Concrete, asphalt, or limerock repairs required specifically for the HDD installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 9. Combination Air/Vacuum Valves and Vaults—The Contractor shall furnish and install all labor, materials, equipment, and services for constructing and placing into operation combination air/vacuum valves and vaults as shown on the Drawings in accordance with the Contract Documents, including but not limited to combination air/vacuum valves, pipe saddles, corporation stops, pipe, fittings, isolation valves, gravel bedding, valve boxes, valve manholes with H-20 traffic covers, ARV enclosure, excavation, backfill, and appurtenances. The Contractor will be paid for each combination air/vacuum valve and vault installed complete as measured in place.

Item 10. Concrete Restoration—The Contractor shall furnish all labor, materials, equipment, and services for constructing the concrete restorations as shown on the Drawings in accordance with the Contract Documents, including but not limited to removing and disposing of existing concrete, surface preparation, earthwork, grading, fill, backfill, leveling (where required), concrete pavement, striping, marking, reflectors, and related appurtenances to the satisfaction of the Owner and the permitting agencies. The trench width will be paid according to the Specifications and detail widths. The Contractor will be paid on a unit-price basis for each square yard of concrete restored and installed complete as measured in place.

Item 11. Limerock Restoration—The Contractor shall furnish all labor, materials, equipment, and services for constructing the limerock restorations as shown on the Drawings in accordance with the Contract Documents, including but not limited to removing and disposing of or reusing existing limerock, surface preparation, earthwork, grading, fill, backfill, leveling (where required), and related appurtenances to the satisfaction of the Owner and the permitting agencies. The trench width will be paid according to the Specifications and detail widths. The Contractor will be paid on a unit-price basis for each square yard of limerock restored and installed complete as measured in place.

Item 12. Asphalt Concrete Restoration—The Contractor shall furnish all labor, materials, equipment, and services for constructing the asphalt restorations as shown on the Drawings in accordance with the Contract Documents, including but not limited to removing and disposing of existing asphalt, surface preparation, earthwork, grading, fill, backfill, prime and tack coats, leveling (where required), asphalt pavement, striping, marking, reflectors, and related appurtenances to the satisfaction of the Owner and the permitting agencies. The trench width will be paid according to the Specifications and detail widths. The Contractor will be paid on a unit-price basis for each square yard of asphalt concrete restored and installed complete as measured in place.

Item 13. Testing Allowance—The Contractor shall furnish all labor, materials, equipment, and services necessary for geotechnical in-place density testing of soils and pavement, concrete cylinder testing, and other testing as required by the Engineer and as specified in the Contract Documents. The Contractor will be reimbursed by the Owner for passing tests. Failed tests will not receive additional compensation.

Item 14. Record Drawings Allowance—The Contractor shall furnish all labor, materials, equipment, and services for composing and providing Record Drawings for the entire project in accordance with the Contract Documents, including but not limited to updating the electronic copy of the Drawings, identifying items that were revised during the project or addenda, having all Drawings signed and sealed by a Florida-certified Professional Land Surveyor, and providing signed-and-sealed paper copies of the Record Drawings. Once the Record Drawings have been determined by the Engineer to be complete according to the Specification requirements, the entire lump sum will be paid to the Contractor.

END OF SECTION

SECTION 01290
SCHEDULE OF VALUES

PART 1 GENERAL

1.01 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. To the Engineer, a proposed Schedule of Values allocated to the various portions of the Work, in accordance with Section 01000, Project Requirements, and Section 01200, Measurement and Payment.

B. Upon request of the Engineer, supporting data which will substantiate the values' correctness.

C. The accepted Schedule of Values shall be used only as the basis for the Contractor's Applications for Payment.

D. An update and resubmittal of the Schedule of Values when Change Orders affect the listing or when the actual performance of the Work involves necessary changes of substance to values previously listed and approved.

E. Schedule of Values

1. Submit typed schedule on EJCDC 1910-8-E forms provided by the Engineer. The Contractor's standard form or electronic media printout will be considered.
2. Submit Schedule of Values in duplicate within 10 days after the date of Owner-Contractor Agreement.
3. Format – Use the schedule of prices in the Bid Proposal. Show the cost breakdown for each lump-sum item. The lump-sum breakdown shall, at a minimum, use the Table of Contents of this manual outline. Identify each line item with the number and title of the major Specification Section. Identify site mobilization and demobilization, bonds and insurance, Record Drawings, photographs, and operations and maintenance manuals, etc.
4. For unit cost allowances, identify quantities taken from the Contract Documents multiplied by the unit cost to achieve the total for the item.
5. Include within each line item a direct proportional amount of the Contractor's overhead and profit.

6. Revise the schedule to list approved Change Orders with each Application for Payment.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 CASH ALLOWANCES

A. Costs Included in Allowances—The cost of the product to the Contractor or subcontractor, less applicable trade discounts and applicable taxes.

B. Costs Not Included in the Allowance, But Included in the Contract Price—Product handling at the site, including unloading, uncrating, and storage; protection of products from elements and from damage and labor for installation and finishing.

C. Contractor Responsibilities

1. Execute purchase agreement with designated supplier.
2. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
3. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

D. Differences between allowance amounts and actual costs will be adjusted by Change Order before final payment.

E. Cash Allowances Schedule

1. Testing.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01310
CONSTRUCTION COORDINATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall coordinate Work with that of other construction projects as needed.

B. Before starting Work and from time to time as the Work progresses, the Contractor and each subcontractor shall examine the work and materials installed by others as it applies to its own work and shall notify the Engineer immediately in writing if any conditions exist which will prevent satisfactory results in the installation of the system. Should the Contractor or subcontractor start work without such notification, it shall be construed as an acceptance of all claims or questions as to the suitability of the work of others to receive its Work. The Contractor shall remove and/or replace, at its own expense, all work under this Contract which may have to be removed on account of such defects or omissions.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. The Contractor shall ensure that all drawing, product data, and samples comply with Contract Documents and field dimensions and clearances.

B. The Contractor shall submit requests for interpretation of Contract Documents in a timely fashion to ensure there are no disruptions with the Work as scheduled. Obtain instructions through the Engineer to resolve all queries.

C. Process requests for substitutions and Change Orders through the Engineer.

D. Deliver close-out submittals to the Engineer.

1.03 WORK SEQUENCE

A. The Contractor shall submit a preliminary Progress Schedule, in accordance with Section 01320, Progress Schedule, to the Engineer. After review, the Contractor shall revise and resubmit the Progress Schedule to comply with requested revisions.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 CONSTRUCTION MOBILIZATION

The Contractor shall do the following:

A. Cooperate with the Owner in allocating mobilization areas on site for field offices and sheds, access, traffic, and parking facilities. During construction, the Contractor shall coordinate the use of the site and facilities through the Engineer.

B. Comply with the Engineer's procedures for intra-project communications: submittals, reports and records, schedules, coordination drawings, recommendations, and resolution of ambiguities/conflicts.

C. Comply with the Engineer’s instructions for use of temporary utilities and construction facilities.

D. Coordinate field engineering and layout work under instructions of the Engineer.

E. Coordinate scheduling, submittals, and work of the various Sections of Contract Documents to ensure the efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.

F. Coordinate the sequence of Work to accommodate the Owner occupancy as specified in the Contract Documents.

G. In addition to Progress Meetings specified in Section 01320, Progress Schedule, hold pre-construction conferences with personnel and Subcontractors to ensure coordination of Work. The Engineer shall be informed of such meetings and shall be allowed to attend.

H. Coordinate the Work of various sections having interdependent responsibilities for installing equipment, connecting equipment, and placing such equipment in service.

I. Coordinate the use of project space and the sequence of installing civil, mechanical, structural, instrumentation, systems, and electrical work. Follow practicable routings for pipes, ducts, and conduits, with due allowance for available physical space; make runs parallel with lines of building. Use space efficiently to maximize accessibility for other installations, maintenance, and repairs.

J. Coordinate Work at existing facilities to minimize disruption of the Owner's operations.

K. Assemble and coordinate close-out submittals specified in Section 01770, Project Closeout.

1.07 COORDINATION DRAWINGS

A. The Contractor shall provide information required by the Engineer for preparing coordination drawings.

B. The Contractor shall review drawings before submitting them to the Engineer.

1.08 CLOSE-OUT PROCEDURES

The Contractor shall do the following:

A. Notify the Owner when Work is considered ready for Substantial Completion.

B. Comply with the Owner's instructions to correct items of Work listed in executed Certificates of Substantial Completion.

C. Notify the Owner when Work has reached Final Completion.

D. Comply with the Owner's instructions for completing items of Work found incomplete in the Engineer's final inspection.

E. Comply with Section 01770, Project Closeout.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. All vehicles on the property or easement must be operational.

3.02 UTILITIES

A. The Contractor shall coordinate the activities of all utility companies with equipment in the construction area with the Contractor's and Subcontractor's Work.

3.03 CUTTING AND PATCHING

A. No cutting and patching of new Work will be accepted. All Work must be new and continuous in its final form.

END OF SECTION

SECTION 01320
PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. All work of this Contract shall be scheduled and monitored by the Contractor using the Critical Path Method (CPM) and shall use the Precedence Diagram Method (PDM) of scheduling. The Contractor shall prepare all schedules and all monthly updates described in this Section. The Contractor will prepare revisions of the schedule to reflect changes in the Contractor's plan of performance or changes in the Work and submit these revisions to the Engineer for acceptance. The Engineer's acceptance of the scheduling documents is to ensure that all CPM Scheduling documents prepared by the Contractor are in conformance with the Contract Documents and Specifications described herein. This acceptance will not impose on the Engineer or Owner the responsibility for the schedule or for the sequencing, scheduling, or progress of the Work, nor will the acceptance interfere with or relieve the Contractor of full responsibility for the schedule and the means, methods, procedures, and sequence of construction.

B. The Contractor shall use the latest version of Primavera Scheduling software, or an approved equal, for all CPM Scheduling applications.

C. The Engineer or Owner may retain the professional services of a CPM Scheduling Consultant to assist in the review and acceptance of the CPM Scheduling documents prepared by the Contractor. Therefore, any reference to the Engineer or Owner within this Section may also indicate the involvement of the Engineer's or Owner's CPM Scheduling Consultant.

D. The Contractor shall prepare and maintain a detailed progress schedule throughout the construction of the Project. The schedule shall be the Contractor's working schedule and be used to plan, organize, and execute the Work, record and report actual performance and progress, and show how the Contractor plans to complete the Work. The schedule will be in the form of an activity-oriented network diagram (CPM).

E. When the Contractor prepares the CPM Schedule and the schedule is accepted by the Engineer, it shall become part of the Contract Documents and will be used by Contractor and Engineer to monitor the progress of the Project. The CPM Schedule may be revised to show changes in the Contractor's method or manner of performance; delays, or authorized changes in the Work. All changes to the schedule will be made in accordance with Article 1.07 of this Section.

F. The Contractor acknowledges that free float belongs to the Owner.

1.02 PRELIMINARY 90-DAY CPM SCHEDULE

A. The Contractor shall develop a 90-Day CPM Schedule within 10 days after the date indicated in the Notice to Proceed. This schedule shall be a computerized CPM Schedule showing only the early start, early finish of each work activity. The 90-Day Schedule shall contain work activities over the first 90 days, and the estimated durations for each work activity shall be 15 workdays or less. The balance of the job shall be shown in summary log. The 90-Day Schedule shall include but not be limited to site work, hazardous material removal, demolition, key procurement activities (i.e. submissions, approvals, fabrication, and delivery), equipment, mechanical, electrical, and plumbing coordination and any other work that will occur during the first 90 days. This 90-Day Schedule shall become part of the Detailed CPM Schedule.

1.03 DEFINITIONS

The following terms used in this Section shall have the following meanings:

A. *Activity.* A fundamental unit of work in a CPM Schedule establishing the time and resources required for performing or furnishing a part of the Work or a requisite step. Each Activity has defined geographical boundaries, time duration in days, and a detailed estimate of resources required to construct the task. Each activity is assigned a unique description, activity number, activity code, and a dollar value.

B. *Record Schedule.* The Record Schedule will have actual start dates and actual finish dates for all work Activities and Milestones necessary to complete the Work.

C. *Baseline Schedule.* The Engineer-accepted Proposed Baseline Schedule. The Baseline Schedule is the Contractor's plan which has been approved by the Engineer for completion of the Work in compliance with the Milestones listed in the Contract Documents and within the Contract Time. The Baseline Schedule may be revised only by the Engineer's approval of a Contractor-produced adjusted Baseline Schedule. The Baseline Schedule for the Work is the sole basis for (a) the monitoring of the Contractor's progress against Milestones and the Contract Time; (b) calculating Total Float or Contract Float; and (c) the evaluation and reconciliation of extensions in Contract Time, if any. The first Baseline Schedule shall be designated by all parties as the Baseline Schedule, Rev. 0. When Baseline Schedules are adjusted by the Contractor and approved by the Engineer, they shall be designated as Baseline Schedule, Rev. 1, 2, 3, etc. (as appropriate) and shall replace the previously approved Baseline Schedule.

D. *Contract Float.* Workdays between the Contractor's expected date for early completion of the Work, or specified part, and the corresponding Contract Time.

E. *CPM Network.* The structure of the computerized schedule. The CPM Network accounts for the entire Work and defines the construction logic in terms of all of the Activities with their logical dependencies.

F. *Critical Path.* A series of Activities linked by dependencies that determine the shortest possible time to complete the Work.

G. *Early Dates.* The early start dates and early finish dates, i.e., the dates each Activity will start and finish if each is started at the earliest end of the range of dates that the CPM indicates the Activities can be performed.

H. *Excusable Delay.* An unforeseeable delay, beyond the control of the Contractor, experienced due to no fault or negligence by the Contractor, its subcontractors, or suppliers.

I. *Free Float.* The amount of time that any activity can be delayed without adversely affecting the early start of the following activity.

J. *Fragnet.* A predefined or individual segment of a network which represents a specified sequence of the Work. Fragnets shall be submitted which include all Activities, required resources, and costs and shall be submitted to the Engineer for approval of all Change Orders before their incorporation into the Baseline Schedule by the Contractor. A Fragnet shall be submitted before approval of any proposed logic changes. Fragnets are banded Activities representing a revised portion of the Baseline Schedule and shall be logically connected and constrained by previously existing predecessor and successor Activities, as applicable.

K. *Late Dates.* The late start dates and the late finish dates; i.e., the dates each Activity will start and finish if each is started at the latest end of the range of dates that the CPM Network indicates the Activities can be performed and still achieve the Milestones and Contract Time.

L. *Milestone.* A point of progress designated for the purpose of establishing start or finish times for a key aspect of the Work.

M. *Predecessor Activity.* An Activity which precedes another Activity (to which it is logically tied) in the CPM Network.

N. *Preliminary Schedule*. The Contractor's Baseline Schedule for the first 180 days of the Contract.

O. *Proposed Baseline Schedule.* The Proposed Baseline Schedule shall represent the Contractor's plan for completion of the Work in compliance with Milestones listed in the Contract Documents and within the Contract Time. It represents the Contractor's first complete planned schedule submitted for review and approval by the Engineer. The Proposed Baseline Schedule shall take into account all foreseeable activities to be accomplished by any separate contractors, utility owners, or the Owner's operations. The Proposed Baseline Schedule shall anticipate all necessary manpower and resources to accomplish activities within the durations set forth in the Proposed Baseline Schedule. The Proposed Baseline Schedule shall address and indicate all submittals required by the Contract and indicate the times allowed for review, resubmittal, and approval of submittals. Upon approval by the Engineer, the first Proposed Baseline Schedule shall become the Baseline Schedule, Rev. 0.

P. *Resource Loading.* The allocation of work force and equipment necessary for the completion of an Activity as scheduled.

Q. *Six-Week Schedule.* A detailed progress schedule taken from the Working Schedule, which discloses the plan for the next 6 weeks' Work and the actual schedule for the previous 6 weeks' Work.

R. *Successor Activity.* An Activity which follows another Activity (to which it is logically tied) in the CPM Network.

S. *Total Float.* The number of workdays by which a part of the Work in the Baseline Schedule or Revised Baseline Schedule may be delayed from its Early Dates without necessarily extending the Contract Time.

T. *Working Schedule.* When the Proposed Baseline Schedule (or a subsequent adjustment is made by the Contractor to the Baseline Schedule) is accepted by the Engineer and becomes the Baseline Schedule, Rev. 0, 1, 2, 3, etc., it shall be duplicated and become the Working Schedule. The Contractor shall update the Working Schedule monthly with a Data Date designated by the Engineer. The Working Schedule shall be updated monthly to reflect actual progress only and shall be the basis for determining monthly progress payments and the Contractor's performance in relation to the most recently approved Baseline Schedule. The Final Working Schedule shall be the Record Schedule.

1.04 DETAILED CPM SCHEDULE

A. The Detailed Network Diagram shall provide sufficient detail and clarity of form and technique so that the Contractor can plan, schedule, and control his work properly and the Engineer can readily monitor and follow the progress for all

portions of the Work. The Detailed Network Diagram shall comply with the Contract Times of the Agreement and various limits imposed by the Contract Documents, including required sequencing of portions of the Work described in Section 01100, Summary of Work. The degree of detail shall be to the satisfaction of the Engineer, but the following factors shall have a bearing on the required depth of activity detail:

1. The structural breakdown of the Project.
2. Project phasing and/or milestones.
3. The type of work to be performed and the labor trades involved.
4. All purchase, manufacture, and delivery activities for all major materials and equipment.
5. Maintenance of facilities in operation.
6. Submittal and approval of shop drawings and material samples.
7. Plans for all subcontract work.
8. Crew flows and sizes.
9. Assignment of responsibility for performing all activities.
10. Access and availability to work areas.
11. Identification of interfaces and dependencies with preceding, concurrent, and follow-on subcontractors and contractors.
12. Testing and start-up of systems.
13. Planning for phased takeover by the Owner.

B. Activities shown shall be in workdays and shall have a maximum duration of 5 days, except in the case of non-construction activities such as procurement of materials and delivery of equipment. All durations shall be the result of definitive manpower and resource planning by the Contractor.

C. The Detailed Network Diagram shall be prepared using a computer plotter.

1.05 COMPUTERIZATION OF THE DETAILED CPM SCHEDULE

A. The mathematical analysis of the Detailed Network Diagram shall be made by computer, and a tabulation for each activity shall include the following:

1. Unique event numbers.
2. Activity descriptions.
3. Durations in workdays for each activity.
4. Earliest start date (by calendar date).
5. Earliest finish date (by calendar date).
6. Latest start day (by calendar date).
7. Latest finish day (by calendar date).
8. Slack or total float in workdays.
9. Percentage of activity completed.

B. The following computer outputs shall be prepared as part of the initial schedule submission and each update thereafter:

1. Activity file sort.
2. Eight-week “Look Ahead” detailed bar chart.
3. Summary bar chart.
4. Additional computer sorts to the schedule as required by the Owner.

1.06 COMPLETION REQUIREMENT

A. The 90-Day Schedule shall be completed within 10 calendar days after the date indicated in the Notice to Proceed.

B. The Detailed CPM Schedule shall be prepared within 30 calendar days after the date indicated in the Notice to Proceed.

C. If the Contractor fails to provide the required CPM scheduling documents to the Engineer within the time prescribed and/or revisions of the scheduling documents within the required time, the Contractor shall be in default of the Contract requirements and the Engineer may withhold approval of progress payments until such time as the Contractor submits the required information.

D. Notwithstanding the implementation of the Progress Schedule, it shall be the sole responsibility of the Contractor to complete the Work within the time of completion required by the Contract.

1.07 UPDATINGS

A. The 90-Day CPM Schedule shall be updated monthly until the Engineer accepts the Detailed CPM Schedule.

B. The first update of the Detailed CPM Schedule shall take place 60 calendar days after the Notice to Proceed with subsequent updates performed monthly at the jobsite for the duration of the Contract.

C. The Contractor shall update the Detailed CPM Schedule monthly, using a cutoff/ data date agreeable to the Contractor and the Engineer. This cutoff/data date shall be consistent from month to month. The update information shall include but not be limited to the following:

1. Actual start dates.
2. Actual completion dates.

3. Activity percent completion.
4. Remaining duration of activities in progress.

D. The Contractor shall update all the scheduling documents and submit these documents to the Engineer within 5 workdays of the cutoff/data date.

E. The Contractor shall submit seven copies of the CPM schedule and one electronic copy of the CPM schedule on a CD.

F. As part of the normal CPM update, the Contractor shall prepare a written narrative report highlighting the progress during the past update period. The written narrative report shall include but not be limited to the following information:

1. Summary of work accomplished during the past update period.
2. Milestone Comparison Chart.
3. Analysis of Critical Path(s).
4. Analysis of Secondary Critical Path(s). Secondary Critical Path is defined as float within 10 workdays of Critical Path.
5. Analysis of time lost/gained during the update period.
6. Identification of problem areas.
7. Identification of change orders and/or any delay that is impacting/delaying the project schedule.
8. Solutions to current problems.

G. The Contractor is required to attend and participate in a CPM update review meeting with the Engineer. Attendance is mandatory. This meeting will take place 7 workdays after the cutoff/data date, or during progress meetings as decided by the Owner and the Engineer. The purpose of this meeting is to review past progress, current status, problem areas, and future progress. The Contractor's narrative report will be reviewed at this meeting.

H. All schedule update information outlined above will be reviewed and accepted by the Engineer.

1.08 RECOVERY SCHEDULE

A. If the Contractor fails to achieve the planned progress, as indicated in the approved/updated detailed CPM Schedule, and the Contractor's lack of progress delays the Critical path and/or an intermediate milestone by more than 10 workdays (monthly or cumulatively), the Contractor shall submit to the Engineer for review and acceptance a proposed Recovery Schedule indicating how the Contractor will recover the time lost.

B. If the Contractor fails to submit a Recovery Schedule and/or fails to cooperate with the Engineer in the Recovery Schedule process, the Owner can immediately order the Contractor to accelerate completion of the late activities which have been delayed by whatever means necessary without any additional costs to the Owner. The Owner can withhold future progress payments until the Contractor's progress is in compliance with the Contract Schedule or until the Owner has approved by Change Order proposed adjustments to the contract milestones, extension of contract time, or modification of the Contract Schedule.

1.09 CHANGE ORDERS, DELAYS, AND EXTENSIONS OF TIME

A. When proposed Change Orders, approved Change Orders, or any delays are experienced and the Contractor believes the Change Order/Delay is causing delay to an intermediate contract milestone or to the project completion, the Contractor shall submit to the Engineer a Time Impact Analysis, explaining the influence of each Change Order/Delay on the current updated Contract CPM Schedule. The Contractor shall prepare a "Fragnet" (network analysis) of each Change Order/Delay on the current updated Contract CPM Schedule. The analysis will demonstrate the time impact based on the date the change is given to the Contractor, the status of construction at that point in time, and the event time computation of all affected activities. The event times used in the analysis shall be those included in the latest updated copy of the detailed CPM Schedule closest to the time of delay or as accepted by the Engineer.

B. For the Contractor to be entitled to an extension of Contract time to an intermediate contract milestone and/or to the project completion, the Time Impact Analysis must show that the Change Order/Delay impacts the intermediate contractual milestone date and/or the updated CPM Schedule's Critical Path, thereby directly impacting the project completion date. Change Orders/Delays that do not impact intermediate contractual milestones and/or the critical path and impact activities with float will not be considered as a delay to the project and no extension of time will be granted.

C. The Contractor must submit a written analysis within 7 calendar days after a delay occurs or authorized change in work is given to the Contractor. If the Contractor does not submit a written analysis for specific Change Order(s) or Delay(s) within the specified period of time, then it is mutually agreed that the particular Change Order of Delay has no time impact on the Project CPM Schedule and no time extension is required.

D. The Engineer will accept or reject each Time Impact Analysis within 14 calendar days after submittal unless subsequent meetings and negotiations are necessary. Upon the Engineer's acceptance, the Contractor will incorporate fragnets

illustrating the influence of the Change Orders and Delays into the Detailed CPM Schedule during the first update after agreement is reached.

1.10 PROGRESS MEETINGS

A. The Owner will conduct progress meetings at least once per month to discuss the progress of the Work. The Contractor and any subcontractors the Contractor deems necessary shall attend these meetings. At the Owner's discretion, the frequency of the meetings may be increased if the progress of the Work is not satisfactory or if coordination problems should arise.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01325
CONSTRUCTION PHOTOGRAPHS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall have digital pictures, photographs, and DVDs made of the Work from views and at such times as directed by the Engineer. These photographs shall represent a visual history of the Project, from Contract Award through Contract Completion.

B. The Contractor shall take a preconstruction video of the entire site, including the areas of adjacent properties within 100 feet of the limit of Work. Special effort shall be made to show the existing paved roads, shoulders, signs, and other existing features.

C. The Contractor shall also use electronic "snap-shot" photography as necessary to record and facilitate resolution of on-site issues through the transmission of electronic photographs by e-mail from the site to the Engineer's and Owner's offices.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS

2.01 PRODUCTS

A. Photographs and digital pictures shall be in color. Provide one copy of each digital picture on each of three CDs.

B. Provide photographs taken of each of the major items during construction.

C. View and Quantities Required: A minimum of 30 images per month clearly showing project status and key elements of construction.

D. Deliver electronic images supplied on USB storage media to the Engineer with every pay request.

PART 3 EXECUTION

3.01 VIEWS REQUIRED

A. Photographs shall be from locations to illustrate the condition of construction and the state of progress adequately.

B. The Contractor shall provide before and after photographs of each portion of the site. The below-ground facilities shall include all equipment, walls, floor, piping, supports, and entrance. At major locations photographs shall include before, during, and after photographs and all photographs shall be organized by ascending date order to show the Work as it progresses.

3.02 DESCRIPTIVE INFORMATION

A. Each photograph shall have a permanent title block on the back and shall contain the typed information and arrangement as follows:

COMPLETE PROJECT NAME
Contract No.

CONTRACTOR:	(Name of Contractor)
DATE:	(When Photo was Taken)
PHOTO NO.:	(Consecutive Numbers)
PHOTO BY:	(Firm Name of Photographer)
LOCATION:	(Description of Location and View)

B. The Contractor shall provide the Engineer with a written description of each photograph. This description shall be included in the binders and a copy shall be submitted with the CDs. The Field Engineer or inspector shall approve the description.

3.03 VIDEOTAPE REQUIREMENTS

A. Major Locations

1. The Contractor shall provide color digital video of each major facility and structures and facilities adjacent to the construction before construction starts, during construction, and when construction has been completed.

Approximately every 2 weeks, 15 minutes of digital video shall be submitted to the Engineer showing Work completed, Work in progress, Work started, and problems which occurred since the last taping. The Contractor shall maintain the master video CD ROM of each portion of the facility on the Work site. The master video shall be a running chronicle of construction progress. The Contractor shall combine the bi-weekly video onto the master video. The bi-weekly video shall be submitted to the Engineer within 10 working days after recording and the bi-weekly videos may include multiple locations.

2. All videos shall be recorded with character generator operating with date, time, and location on screen. During video recording, the Contractor shall narrate the video, explaining what is being shown, the problem that has occurred, and what is being done. All videos shall be delivered to the Engineer before Final Completion is submitted.

3.04 DIGITAL PHOTO DOCUMENTATION

A. Catalog and manage Electronic “snap-shots” and images of photographs in a secure digital photo management system capable of being linked to the project schedule and document management database. Add captions, descriptions, and key words. Transfer a copy of all “snap-shots” and photos with their related notes, keywords, captions, and activity IDs to the Engineer weekly.

B. All photographs shall be clear, sharp, and free of distortion after enlargement. Each photograph shall have a permanent title block in the lower right-hand corner which shall be 2 1/2 inches high by 6 inches wide and shall contain the information and arrangement as described in Paragraph 3.02.A above.

END OF SECTION

SECTION 01330
SUBMITTALS AND ACCEPTANCE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall submit documentation that describes the Work to be performed under the Contract as required in this Section. This documentation will be for the Engineer and Owner's review and use. The documentation furnished by the Contractor must enable the Engineer and Owner to verify the Contractor's performance and compliance with Contract requirements. The documentation shall cover all services and deliverables required and secured by the Contract Documents.

1.02 SUBMITTALS

A. General—The Contractor shall submit the following:

1. Project documentation: For the Engineer and Owner's internal use and shall include all information that will be essential for the facility's operations, maintenance, training, and repair of equipment and facilities supplied by the Contractor. The Contractor shall submit all documentation necessary to ascertain compliance with technical/contractual provisions.

2. Shop drawings: Drawings, schedules, diagrams, warranties, and other data prepared specifically for this Contract by the Contractor or through the Contractor by way of subcontractor, manufacturer, supplier, distributor, or other lower-tier contractor to illustrate a portion of the Work.

3. Product data: Preprinted materials such as illustrations, standard schedules, performance charts, instructions, brochures, diagrams, manufacturer's descriptive literature, catalog data, and other data to illustrate a portion of the Work, but not prepared exclusively for this Contract.

4. Samples: Physical examples of products, materials, equipment, assemblies, or workmanship that are physically identical to portions of the Work, illustrating portions of work, or establishing standards for evaluating appearance of finished work or both.

5. Administrative submittals: Data presented for reviews and acceptance to ensure that administrative requirements of the project are adequately met

but not to ensure directly that work is in accordance with the design concept and in compliance with Contract Documents.

6. Mockups: Before installing work requiring mockups, the Contractor shall build mockups for each form of construction and finish required using materials indicated for the completed Work, as follows:

    a. Build mockups in the location and of the size directed by the Engineer.
    b. Notify the Engineer 7 days in advance of dates and times when mockups will be constructed.
    c. Demonstrate the proposed range of aesthetic effects and workmanship.
    d. Obtain the Engineer’s acceptance of mockups before starting work, fabrication, or construction.
    e. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
    f. Demolish and remove mockups when directed by the Engineer.

B. Coordination

1. Submittals and schedules shall be checked and coordinated with the Work of all trades involved before they are submitted and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the Contractor for resubmission.

C. Start of Work

1. Within 30 calendar days after the notice to proceed for the project, the Contractor shall submit to the Engineer a Contract Data Requirements List that defines all data to be submitted under this Contract. Included in this list shall be the names of all proposed manufacturers furnishing specified items to the extent known. Review of this list by the Engineer shall in no way relieve the Contractor from providing materials, equipment, systems, and structures fully in accordance with the Specifications.

D. General Requirements

1. The Contractor shall prepare, assemble, and submit all documents as described herein. The Contractor shall submit certification that the documents prepared conform to the Contract requirements and will result in a complete and operable project. The Engineer and Owner shall review

the Contractor's documents for conformance to the Contract requirements and may comment on the documents.

2. The Contractor shall approve and certify all project documents. The Contractor's failure to certify the documents or failure to provide documents that demonstrate conformance to the Contract requirements are grounds for rejection. The Contractor shall be responsible for and bear all costs for proceeding with any part of the Work that fails to meet the Contract requirements.
3. Submittal of documents for the Engineer's review shall in no way relieve the Contractor of full responsibility for providing a complete, safe, reliable, operating, and coordinated Work (system/equipment/facilities) that is in compliance with these Contract documents.

E. Requests for Substitution

1. All requests for substitution shall clearly and specifically indicate any and all differences or omissions between the products specified as basis of design and the product proposed for substitution. Data shall include but not be limited to differences as follows for both the specified and substituted products:

    a. Principle of operation.
    b. Materials of construction or finishes.
    c. Thickness or gauge of materials.
    d. Weight of item.
    e. Deleted features or items.
    f. Added features or items.
    g. Changes in other work caused by the substitution.
    h. If the substitution contains differences or omissions not specifically called to the attention of the Engineer, the Engineer reserves the right to require equal or similar features to be added to the substituted product at the Contractor's expense.

F. Submittal Requirements and Procedures

1. Drawing Formats and Requirements

    a. Drawings—All Drawings and Shop Drawings shall be prepared on 22-x-34-inch paper and shall have a blank area of 3 x 4 inches in the lower right hand corner above the title block. Each Drawing shall indicate the following information in the title block:

        (1) Title and Drawing Number.
        (2) Date of Drawing or Revision.

(3) Name of Building or Facility.
(4) Name of Contractor or subcontractor.
(5) Drawing contents and locations.
(6) Specification Section and Subsection Numbers.

b. Required Copies—All drawings submitted shall have a minimum of eight copies distributed in the following way:

(1) 2—Owner.
(2) 4—Jones Edmunds.
(3) 2—Returned.

2. Product Data

a. Requirements—Product data shall include all catalog cuts, performance surveys, test reports, equipment lists, material lists, diagrams, pictures, and descriptive material. All product data shall be submitted on either 8.5-x-11-inch or folded 11-x-17-inch size paper of 20-lb (9.072 kg) weight. The submittal information shall show the standard and optional product features, as well as all performance data and specifications. The manufacturer's recommendation for special tools shall be supplied.

3. Samples—The Contractor shall furnish samples required by the Contract Documents, for review by the Engineer. Samples shall be delivered to the Engineer as specified or directed.

a. All samples shall be of sufficient size and quantity to illustrate clearly the functional characteristics of the product, with integrally related parts and attachment devices. The samples shall show the full range of color, texture, and pattern.
b. The Contractor shall submit a minimum of four samples of items submitted. All samples shall be marked with required submittal information, as specified above.

4. Color, Texture, and Pattern Charts

a. The Contractor shall submit color, texture, or pattern charts of all required finishes.
b. A minimum of four charts of each item shall be submitted.

5. Submittal Information Requirements

a. When used in the Contract Documents, the term "Submittal Information" shall be considered to mean the following information at a minimum:

(1) Contract Name.
(2) Contract Number.
(3) Location within Facility.
(4) Date Submitted.

b. Drawings—The Contractor shall mark submittal information on all Drawings in the left half of the 4-x-3-inch block as described above.

c. Product Data and Manufacturer's Literature—The Contractor shall mark all product data and manufacturer's literature with submittal information and note which item is being furnished. The Contractor shall mark the option and supplies to be furnished with the item. At least one original manufacturer product data sheet must be submitted; the balance can be copied. Do not submit the manufacturer's general catalog: submit only items being installed or delivered. When manuals are being submitted, the Contractor shall mark submittal information on both the cover and title page. If manuals being submitted contain more than just one item, each item must be marked and only Contract name and number is to be marked on the cover and title page.

6. Training, Operation and Maintenance Manuals

a. The Contractor shall submit to the Engineer for review and acceptance of manufacturer's installation, operations, lubrication, maintenance, and training manuals for all equipment installed or delivered under this Contract. All manuals shall have submittal information marked on the front cover, title page, and three places inside the manual. If the manual being submitted is for different components, mark the front cover and title page only. Each component section must be marked with the Specification Section and subsection numbers. Operations and Maintenance Manuals shall conform to requirements defined in Section 01830, Operations and Maintenance Manuals.

G. Required Submittals

1. Structural Submittals

a. This Section specifies general procedural requirements for contractual submittals for the following structural schedules, product data, samples, and manufacturer's certificates.

(1) Product Data—The Contractor shall provide product data for all structural items, options, and other data and provide supplemental manufacturer's standard data for information unique to the Work and installation. The submittals shall reflect all items delivered or installed under this Contract.
(2) Samples—The Contractor shall provide all samples required under this Specification including color charts and product samples.
(3) Material, equipment, and installation and demolition Specifications.

2. Mechanical and Electrical System Submittals

a. This Section specifies general procedural requirements for mechanical schedules, performance data, control diagrams, and other submittal data.

b. The Contractor shall submit the following:

(1) Performance Data.

(2) Power and Riser Diagrams—Single line riser, power diagrams, and all conduit runs shall be provided for all equipment and facilities.

(3) Wiring Diagrams—Elementary controls diagrams and separate wiring diagrams for mechanical and electrical unit/subsystem. Drawing for starting and shutdown of equipment including controls shall be provided, including a comprehensive description of operation.

(4) Finished Data—Complete surface preparation and finished data for all mechanical and electrical unit/subsystems shall be provided, including a complete list of cleaning instructions.

(5) Factory Testing—Detailed description of factory testing procedures, reporting procedures and criteria for test passing or failing shall be provided for all mechanical and electrical units/subsystems. Testing shall comply with the General Requirements and Technical Requirements Sections.

(6) Site (Field) Testing and Acceptance—Detailed description of site testing and acceptance tests including descriptions of procedures, testing equipment, reporting procedures, and criteria for passing or failing tests shall be provided for all mechanical and electrical units/subsystems. Testing shall comply with General Requirements and Technical Requirements.

(7) Factory Test Report—After fabrication and testing, the Contractor shall submit the results of tests. No shipment of any mechanical and electrical unit/subsystem shall be allowed without the written certification from the Contractor that the equipment conforms to the Contract requirements.

(8) Site Test and Acceptance Report—Site test and acceptance reports shall be submitted to the Owner and Engineer.

(9) Operations and Maintenance Manuals—The Contractor shall furnish manuals for all mechanical and electrical equipment specified under this Contract. Each manual shall include the following at a minimum:

(a) Description of equipment.
(b) Record shop drawing.
(c) Operation and maintenance instructions.
(d) Part lists.
(e) Equipment ratings.
(f) Valve list.
(g) Lubrication instructions.

c. Compliance with this Section does not relieve the Contractor from compliance with the requirements of Section 01830, Operations and Maintenance Manuals.

H. Submittal Review

1. The Engineer's review of the Contractor's documents shall not relieve the Contractor of the responsibility for meeting all of the requirements of the Contract nor of the responsibility for correcting the documents furnished. The Contractor shall have no claim for additional cost or extension in time because of delays due to revisions of the documents that may be necessary for ensuring compliance with the Contract.

2. The Engineer will review a submittal or re-submittal once, after which the cost of review shall be borne by the Contractor. The cost of Engineering shall be equal to the Engineer's full cost.

3. No partial submittals will be reviewed. A submittal or re-submittal not complete will be returned to the Contractor for completing and re-submittal.

4. Documents submitted by the Contractor for approval by the Engineer will be returned bearing a project-specific stamp bearing the dated signature of the reviewer and one of four boxes checked:

   a. NO EXCEPTIONS NOTED—This indicates that the submittal appears to be in compliance with the requirements of the performance specifications and that the Work may proceed.
   b. MAKE CORRECTIONS NOTED—This indicates that the reviewer has added a minor correction to the submission and that the Work (modified in accordance with the correction comment) may proceed. The Contractor shall accept the responsibility of the modified document and resulting Work with no additional compensation.
   c. AMEND AND RESUBMIT—This indicates that the submittal will require Contractor modifications based on the reviewer's comments that accompanied the returned submittal. The Contractor will be cautioned that work may not proceed under this review status.
   d. REJECTED—This indicates that the submittal is not in conformance with the requirements of the performance Specifications and cannot be modified to gain compliance. A new submittal will be required in the instance of a "reject" status and the Contractor will be cautioned that work may not proceed under this condition.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SUBMITTAL PROCEDURES

A. Before submitting documents for the Engineer's review, the Contractor shall review the documentation for conformance to the Contract requirements. Submittals shall be complete and comprise a logical division of the Contract Work.

B. All documentation submitted by the Contractor to the Engineer shall be accompanied by a letter of transmittal and shall be submitted in a sequence that allows the Engineer to have all of the information necessary for checking and accepting a particular document at the time of submittal.

C. Each document shall be identified by a document number, Contract number, Contract name, location, Specification Section, subsection numbers, and submittal date. Where a manual/drawing is revised to reflect a change in design or a change for any other reason, each such revision shall be shown by a revision number, date, and subject in a revision block. Indication of official approval by the Contractor's Project Manager shall also be included. To permit rapid location of the revision, additional notation shall be made in the manual opposite the line or area where the change was made and identified by the corresponding revision number.

3.02 DOCUMENTATION CONTROL AND SUBMITTAL SEQUENCING

A. The Contract Data Requirements List shall be updated and resubmitted to the Engineer monthly, throughout the duration of the Contract. This list shall identify the Contractor's submittal number, proposed and actual submittal date, Contract Specification Section Number, Paragraph, Item of the Work, and type of document.

B. The Contractor shall work with the Engineer to provide a regulated flow of submittals that allows the Engineer to review the submittals in the defined time frame without undue delays. Monthly the Contractor shall provide the Engineer a schedule of the approximate quantities and delivery dates for all submittals due for the next 120 days.

3.03 FINAL RECORD DRAWINGS

A. The Contractor shall submit the Final Record Drawing Package to the Engineer for review at Substantial Completion. The Contractor shall be provided with CADD files, AutoCAD in the version specified by the Engineer. Final Record Drawings shall be printed on 22-x-34-inch sheets and on CDs, in AutoCAD. The Contractor may request to use a different version, but it must be approved by the Engineer. Record Drawings shall be in accordance with Section 01785, Record Documents.

3.04 REQUIREMENTS FOR SUBMITTAL

A. Additional documents, drawings, interface data, and other pertinent project submittal data are listed in specific sections of this Contract.

3.05 RECORD PRINTS

A. The Contractor shall submit one set of all record prints before final completion. The record print or project records shall include submittals, catalog cuts, drawings, calculations, test reports, manufacturer's data, maintenance manuals, installation instructions, and operating manuals. All "record prints" shall be delivered to the Engineer in three-ring binders with dividers and shall be placed in order by Specification Section.

END OF SECTION

SECTION 01350
ENVIRONMENTAL PROTECTION PROCEDURES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Work covered by this Section consists of furnishing all labor, materials, and equipment and performing all work required for the prevention of environmental pollution in conformance with applicable laws and regulations during and as the result of construction operations under this Contract. In this Section *environmental pollution* is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare, unfavorably alter ecological balances of importance to human life, affect other species of importance to man, or degrade the utility of the environment for aesthetic and/or recreational purposes.

B. The control of environmental pollution requires considering air, water, and land and involves managing noise and solid waste as well as other pollutants.

C. The Contractor shall schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the Work. The Contractor shall provide erosion-control measures such as diversion channels, sedimentation or filtration systems, berms, staked synthetic bales, seeding, mulching or other special surface treatments that are required to prevent silting and muddying of streams, rivers, impoundments, lakes, etc. All erosion-control measures shall be in place in an area before any construction activity in that area.

D. This Section is intended to ensure that construction is achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings. These are general guidelines. It is the Contractor's responsibility to determine the specific construction techniques to meet these guidelines.

E. All phases of sedimentation and erosion control shall comply with and be subject to the laws of the State of Florida and the Project Environmental Resource Permit.

1.02 SUBMITTALS

A. The Contractor shall prepare a sedimentation and erosion-control drawing meeting the requirements of the law and furnish two copies of the approved Drawing to the Engineer.

1.03 WORK SEQUENCE

A. Before beginning the Work, the Contractor shall meet with the Engineer to establish agreed-upon compliance with these provisions and administration of the environmental pollution control program.

B. The Contractor shall remove temporary environmental control features when approved by the Engineer and incorporate permanent control features into the project at the earliest practicable time.

1.04 REFERENCE STANDARDS

A. Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. Where this Section differs from these documents, the requirements of this Section shall apply.

B. The Contractor shall comply with all applicable Federal, State, and local laws and regulations concerning environmental pollution control and abatement.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EROSION CONTROL

A. The Contractor shall provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion-control measures, such as siltation basins, check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Surface water shall be prevented from flowing into excavated areas. Ditches shall be used around the construction area to carry away water resulting from dewatering excavated areas. At the completion

of the Work, ditches shall be backfilled and the ground surface restored to its original condition.

3.02 PROTECTION OF STREAMS AND SURFACE WATERS

A. Care shall be taken to prevent or reduce to a minimum any damage to any stream or surface water from pollution by debris, sediment, or other material or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing or that contains oils or sediments that will reduce the quality of the water in the stream shall not be directly returned to the stream. Such waters shall be diverted through a settling basin or filter before being directed into streams or surface waters.

B. The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water, or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.

C. All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action plan approved by the Florida Department of Environmental Protection and the US Environmental Protection Agency. The Contractor shall submit two copies of approved contingency plans to the Engineer.

D. Water being flushed from structures or pipelines after disinfection with Cl_2 shall be treated with a dechlorination solution approved by the Engineer before discharge.

3.03 PROTECTION OF LAND RESOURCES

A. After completion of construction, the Contractor shall restore land resources within the project boundaries and outside the limits of permanent work to a condition that will appear to be natural and not detract from the appearance of the project. All construction activities shall be confined to areas shown on the Drawings.

B. Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, the Contractor shall first wrap the trunk with a sufficient thickness of burlap or rags over which

softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.

C. The Contractor shall protect trees that may possibly be defaced, bruised, injured, or otherwise damaged by the construction equipment, dumping, or other operations by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly.

D. Any trees or other landscape features scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to their original condition. The Owner will decide the method of restoration to be used and whether damaged trees shall be treated and healed or removed and disposed of.

1. All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 1inch in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.
2. Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and, in the opinion of the Owner, are beyond saving shall be immediately removed and replaced.

E. The Contractor’s storage and other construction buildings required temporarily in the performance of the work shall be located in cleared portions of the job site or areas to be cleared as shown on the Drawings and approved by the Engineer and shall not be within wetlands or floodplains. Preserving the landscape shall be required in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for the Engineer’s approval.

F. If the Contractor proposes to construct temporary roads or embankments and excavations for plant and/or work areas, the Contractor shall submit the following for approval at least 10 days before the scheduled start of such temporary work:

1. A layout of all temporary roads, excavations, embankments, and drainage to be constructed within the work area.
2. Details of temporary road construction.
3. Drawings and cross-sections of proposed embankments and their foundations, including a description of proposed materials.
4. Landscaping drawings showing the proposed restoration of the area. The proposed removal of any trees and shrubs outside the limits of the existing clearing area must be indicated. Locations of guard posts or barriers required to control vehicular traffic and protect trees and shrubs to be

maintained undamaged must also be indicated. The drawings shall provide for the obliteration of construction scars as such and shall provide for a natural appearing final condition of the area. Modification of the Contractor's approved drawings shall be made only with the written approval of the Engineer. No unauthorized road construction, excavation, or embankment construction including disposal areas will be permitted.

G. The Contractor shall remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling, and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation within the roadway areas. The disturbed areas shall be prepared and seeded as approved by the Engineer or Owner.

H. All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.

3.04 PROTECTION OF AIR QUALITY

A. Burning—Burning will not be permitted at the project site for the disposal of refuse and debris.

B. Dust Control—The Contractor shall maintain all excavations, embankment, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or outside the project boundaries free from dust which could cause the standards for air pollution to be exceeded and which would cause a hazard or nuisance to others.

C. An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of petroleum products is prohibited. The use of chlorides may be permitted with approval from the Engineer.

D. To be approved, sprinkling must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor shall have sufficient competent equipment on the job to accomplish this. Dust control shall be performed as the Work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Owner.

3.05 NOISE CONTROL

A. The Contractor shall make every effort to minimize noises caused by the construction operations. Equipment shall be equipped with silencers or mufflers

designed to operate with the least possible noise in compliance with Federal and State regulations.

3.06 MAINTENANCE OF POLLUTION-CONTROL FACILITIES DURING CONSTRUCTION

A. During the life of this Contract, the Contractor shall maintain all facilities constructed for pollution control as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created.

END OF SECTION

SECTION 01355
SPECIAL PROVISIONS

PART 1 GENERAL

1.01 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

B. Unless specified otherwise in the Contract Documents, all equipment supplied under these Specifications shall be warranted by the Contractor and the equipment manufacturers for 1 year. The warranty period shall begin on the date of Owner acceptance.

C. The equipment shall be warranted to be free from defects in workmanship, design, and materials. If any part of the equipment should fail during the warranty period, it shall be replaced in the machine(s) and the unit(s) restored to service at no expense to the Owner.

D. The manufacturer's warranty period shall run concurrently with the Contractor's warranty or guarantee period. No exception to this provision shall be allowed. The Contractor shall be responsible for obtaining equipment warranties in accordance with Section 01780, Warranties and Bonds, from each of the respective suppliers or manufacturers for all the equipment specified under the Contract Documents.

E. If the manufacturer is unwilling to provide a 1-year warranty beginning at the time of Owner acceptance, the Contractor shall obtain from the manufacturer a 2-year warranty starting at the time of equipment delivery to the job site. This 2-year warranty shall not relieve the Contractor of the 1-year warranty starting at the time of Owner acceptance of the equipment.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 INSTALLATION OF EQUIPMENT

A. The Contractor shall take special care to ensure proper alignment of all equipment with particular reference to the pumps and electric drives. The units shall be carefully aligned on their foundations by qualified millwrights after the units' sole plates have been shimmed to true alignment at the anchor bolts. The anchor bolts shall be set in place and the nuts tightened against the shims. After the Engineer has approved the foundation alignments, the bedplates or wing feet of the equipment shall be securely bolted in place. The Contractor shall further check the alignment of the equipment after it is secured to the foundations and, after all alignments are conformed, shall finally grout the sole plates in place. The Contractor shall be responsible for the exact alignment of equipment with associated piping and under no circumstances will "pipe springing" be allowed.

B. The Contractor shall furnish all wedges, shims, filling pieces, keys, packing, grout, or other materials necessary to properly align, level, and secure apparatus in place. All parts intended to be plumb or level must be proven to be exactly so. The Contractor shall perform all grinding necessary to bring parts to proper bearing after erection.

1.05 SLEEVES AND OPENINGS

A. The Contractor shall provide all openings, channels, chases, etc., in new construction and furnish and install anchor bolts and other items to be embedded in concrete, as required to complete the Work under this Contract. The Contractor shall perform all cutting, coring, and rough and finish patching required in existing construction for the work of all trades.

B. Subcontractors shall furnish all sleeves, inserts, hangers, anchor bolts, etc., required for the execution of their work. Before the work of the Contractor begins, the subcontractors shall be responsible for furnishing the Contractor with the above items and with templates, drawings, or written information covering chases, openings, etc., which they require and to follow up the work of the Contractor as it progresses, making sure that their drawings and written instructions are carried out. If the subcontractors fail to do this, they shall be responsible for the cost of any corrective measures that may be required to provide necessary openings, etc. If the Contractor fails to carry out the directions given him, covering details and locations of openings, etc., he shall be responsible for any cutting and refinishing required to make the necessary corrections. In no case shall beams, lintels, or other structural members be cut without the approval of the Engineer.

1.06 GREASE, OIL, AND FUEL

A. The Contractor shall furnish all grease, oil, and fuel required for testing equipment with the respective equipment. The Owner shall be furnished with a year's supply of required lubricants including grease and oil of the type recommended by the manufacturer with each item of equipment supplied under the Contract Documents.

1.07 TOOLS

A. The Contractor shall furnish any special tools (including grease guns or other lubricating devices) which may be necessary for the adjustment, operation, and maintenance of any equipment with the respective equipment.

B. Tools shall be furnished in heavy steel toolboxes complete with lock and duplicate keys.

1.08 PIPE MARKING

A. Pipe marking is included in Division 9 under Painting and Coating, but it shall be the Contractor's responsibility, as required by the Engineer, to help identify pipe contents, direction of flow, and all else required for proper marking of pipe.

1.09 VALVE IDENTIFICATION

A. The Contractor shall prepare a valve schedule for all valves required for the Work showing a number, the location, type, function, and normal operating position for each valve. The schedule shall be submitted to the Engineer for approval not less than 120 days before start-up. The Contractor shall coordinate valve identification with Section 15110, Manual, Check, and Process Valves.

B. The Contractor shall furnish tags for all valves required for the Work. Valve tags shall be 2-inch diameter, 19-gauge, brass or plastic, with brass hooks suitable for attaching the tag to the valve operator. Tags shall be stamped or etched with the valve number and the information on the valve schedule coded in a system provided by the Owner. The Contractor shall submit two samples of the type of tag proposed and the manufacturer's standard color chart and letter styles to the Engineer for approval.

C. The Contractor shall install valve tags on all valves required for the Work.

1.10 NOISE LIMITATIONS

A. All equipment to be furnished under this Contract, unless specified otherwise in the Technical Specifications, shall be designed to ensure that the sound pressure level does not exceed 85 decibels over a frequency range of 37.8 to 9,600 cycles per second at a distance of 3 feet from any portion of the equipment, under any load condition, when tested using standard equipment and methods. Noise levels shall include the noise from the motor. Mufflers or external baffles shall not be acceptable for reducing noise. Data on noise levels shall be included with the shop drawing submittal.

1.11 SPARE PARTS

A. Where spare parts are specified in the Specification Sections, the Contractor shall furnish all spare parts recommended by the manufacturer or system supplier for 1 year of service. In addition, the Contractor shall furnish all spare parts itemized in each Section.

B. The Contractor shall collect and store all spare parts in an area to be designated by the Engineer and shall furnish the Engineer with an inventory listing all spare parts, the equipment they are associated with, the name and address of the supplier, and the delivered cost of each item. Copies of actual invoices for each item shall be furnished with the inventory to substantiate the delivery cost.

C. Spare parts shall be packed in cartons properly labeled with indelible markings with complete descriptive information, including manufacturer, part number, part name, and equipment for which the part is to be used and shall be properly treated for 1 year of storage.

1.12 HURRICANE PREPAREDNESS PLAN

A. Within 30 calendar days of the date of Notice to Proceed, the Contractor shall submit a Hurricane Preparedness Plan to the Engineer and the Owner for approval. The Plan shall describe in detail the necessary measures that the Contractor will perform, at no additional costs to the Owner, in case of a hurricane warning. The Contractor shall revise the Plan as required by the Engineer and Owner.

1.13 WEATHER PROTECTION

A. In the event of inclement weather, the Contractor shall protect the Work and materials from damage or injury from the weather. If, in the opinion of the Engineer, any portion of the Work or materials has been damaged by reason of failure on the part of the Contractor to protect the Work, such Work and materials

shall be removed and replaced with new materials and Work to the satisfaction of the Engineer.

1.14 PROVISIONS FOR CONTROL OF EROSION

A. The Contractor shall take sufficient precautions during construction to minimize the run-off of polluting substances such as silt, clay, fuels, oils, bitumens, calcium chloride, or other polluting materials harmful to humans, fish, or other life, into the supplies and surface waters of the State. Control measures must be adequate to ensure that turbidity in the receiving water will not be increased more than 10 nephelometric turbidity units (NTU), or as otherwise required by the State or other controlling body, in water used for public water supply or fish unless limits have been established for the particular water. In surface water used for other purposes, the turbidity must not exceed 25 NTU unless otherwise permitted. Special precautions shall be taken in the use of construction equipment to prevent operations that promote erosion.

1.15 PROVISIONS FOR THE CONTROL OF DUST AND LITTER

A. The Contractor shall take sufficient precautions during construction to minimize the amount of dust created. Wetting down the Site may be required or as directed by the Engineer to prevent dust as a result of vehicular traffic. Control of blowing litter caused by any regrading by the Contractor shall be the responsibility of the Contractor.

1.16 ON-SITE STORAGE

A. The Contractor should note that there may be special storage requirements and possible charges for noncompliance of on-site storage requirements for materials and equipment as specified in Section 01600, Materials and Equipment.

1.17 ELECTRICAL POWER AND TESTING EQUIPMENT

A. The Contractor shall furnish electric power and all equipment and tools required for testing equipment. The cost of this electric power, equipment, and tools shall be included in the prices quoted in the Bid Form.

1.18 PROTECTION AGAINST ELECTROLYSIS

A. Where dissimilar metals are used in conjunction with each other, the Contractor shall provide suitable insulation between adjoining surfaces to eliminate direct contact and any resulting electrolysis. The insulating material shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers, or other approved materials.

1.19 DAMAGE DUE TO HIGH WATER

A. The Contractor will be responsible for all damage done to his work by heavy rains or floods and he shall take all reasonable precautions to provide against damages by building such temporary dikes, channels, or shoring to carry off stormwater as the nature of the work may require.

1.20 EMERGENCY PHONE NUMBERS AND ACCIDENT REPORTS

A. Emergency phone numbers (fire, medical, police) shall be posted at the Contractor's phone and the phone's location be made known to all.

B. Accidents shall be reported immediately to the Engineer by messenger or phone.

C. The Contractor shall document all accidents and shall submit to the Engineer a fully detailed written report about the accident after each accident.

1.21 ITEMS SPECIFIED ON DRAWINGS

A. Items of material, equipment, machinery, and the like may be specified on the Drawings and not in the Specifications. The Contractor shall provide such items in accordance with the Specification on the Drawings.

1.22 DISINFECTION

A. The Contractor shall clean, disinfect, and bacteriologically test and clear, in accordance with Chapters 62-550, 62-555, and 62-560 of the Florida Administrative Code (FAC), all water supply facilities affected by this project which shall come into contact with raw water, water being treated, or treated water before placing the facility in operation. This shall apply to new facilities installed as well as to existing facilities that are to be modified.

B. The Contractor shall employ a disinfection method approved by the Engineer and Owner and shall fully satisfy the Owner that adequate disinfection has been achieved before placing a facility on-line.

C. The cost of all disinfection work shall be included in the prices quoted in the Proposal. The Contractor shall pay for all bacteriological clearance tests.

1.23 SALVAGE

A. Any existing equipment or material, including but not limited to valves, pipes, fittings, couplings, etc., which is removed or replaced as a result of construction

under this project may be designated as salvage by the Engineer or Owner and, if so, shall be excavated, if necessary, and shall be cleaned and stored on or adjacent to the Site in a protected place specified by the Engineer or loaded onto trucks provided by the Owner. Any equipment or material not worthy of salvaging, as directed by the Owner, shall be disposed of by the Contractor at a suitable location at the Contractor's expense.

1.24 WORKMANSHIP, MATERIAL, AND EQUIPMENT

A. When a particular product or products are specified or called for, it is intended and shall be understood that the proposal tendered by the Contractor include those products in his bid. Should the Contractor desire to substitute a product or products equal to those specified, the Contractor shall furnish information as described in the Standard General Conditions. The alternate product or products submitted by the Contractor shall meet the requirements of the Specifications and shall, in all respects, be equal to the product or products specified by name in the Specifications.

B. All apparatus, mechanisms, equipment, machinery, and manufactured articles for incorporation into the Work shall be the new and unused standard products of recognized reputable manufacturers.

1.25 SERVICES OF MANUFACTURERS' FIELD SERVICE TECHNICIAN

A. Bid prices of equipment furnished under the Contract Documents shall include the cost of a competent field service technician of the manufacturers of all equipment to supervise the installation, adjustment, and testing of the equipment and to instruct the Owner's operating personnel on operation and maintenance. The approved manufacturer's operation and maintenance data as specified in Section 01830, Operations and Maintenance Manuals, shall be delivered to the Engineer before instructing the Owner's personnel. This supervision may be divided into two or more periods as required by the installation program or as directed by the Engineer.

B. After the equipment has been installed and the equipment is presumably ready for operation, but before it is operated by others, the manufacturers' field service technician shall inspect, operate, test, and adjust the equipment. The inspection shall include at least the following points where applicable:

1. Soundness (without cracked or otherwise damaged parts).
2. Completeness in all details, as specified and required.
3. Correctness of setting, alignment, and relative arrangement of various parts.
4. Adequacy and correctness of packing, sealing, and lubricants.

5. Calibration and adjustment of all related instrumentation and controls.
6. Energize equipment.
7. Deficiency correction.
8. Demonstration of compliance with application performance specification.

C. The operation, testing, and adjustment shall be as required to prove that the equipment has been left in proper condition for satisfactory operation under the conditions specified.

D. Upon completion of this operation, testing, and adjustment, the manufacturers' field service technician shall submit to the Engineer, in triplicate, a complete, signed report of the results of the inspection, operation, adjustments, and tests. The report shall include detailed descriptions of the points inspected, tests and adjustments made, quantitative results obtained if such are specified, and suggestions for precautions to be taken to ensure proper maintenance.

E. Each equipment manufacturer shall provide instruction to the Owner's operating personnel. Training shall not be performed until the requirements of Paragraphs B, C, and D above have been fully satisfied and any specified performance testing completed. Training shall be provided on an 8-hour-per-day basis. Partial days (less than 8 full working hours) shall not be credited toward the specified durations. Training shall not be concurrent with on-going testing, debugging, or installation activities but shall be a separate activity devoted exclusively to the instruction of the Owner's personnel in the operation and maintenance of the manufacturers' equipment. Training shall be performed by qualified representatives of each equipment manufacturer specifically skilled in providing instruction to operation personnel. Training shall provide an overview of operations and maintenance requirements and shall include but not be limited to the following:

1. Description of unit and component parts.
2. Operating capabilities and performance criteria.
3. Operating procedures.
4. Maintenance procedures.
5. Servicing and lubrication schedules.
6. Troubleshooting.
7. Electrical instrumentation and control requirements and interface as a minimum. The operating and maintenance data to be provided in accordance with Section 01830, Operations and Maintenance Manuals, shall be used as a basis for training.

F. A certificate from the manufacturer stating that the installation of the equipment is satisfactory; that the unit has been satisfactorily tested and is ready for operation; and that the operating personnel have been suitably instructed in the operation,

lubrication, and care of the unit shall be submitted before start-up and acceptance by the Owner. The certificate shall indicate date and time the instruction was given and names of the operating personnel in attendance.

G. See the detailed Specifications for additional requirements for furnishing the services of the manufacturers' field service technician.

1.26 OPERATING AND MAINTENANCE DATA

A. Operating and maintenance data covering all equipment furnished shall be delivered directly to the Engineer, for approval, within 60 days before the facility's start-up. No payment shall be made for equipment installed or stored on site until the Engineer has approved the adequacy and completeness of the operating and maintenance data. Data shall be prepared and submitted in full conformance with Section 01830, Operations and Maintenance Manuals. Final approved copies of operating and maintenance data shall have been delivered to the Engineer on the Owner's behalf 2 weeks before scheduling the instruction period with the Owner.

1.27 RESPONSIBILITY OF CONTRACTOR

A. The Contractor shall be responsible for the entire Work determined by the Drawings, Specifications, and Contract from the date of the starting of the Work until it is accepted as evidence of approval of the Completion Certificate by the Owner. The Contractor shall be responsible for removals, renewals, and replacements due to action of the elements and all other causes except as otherwise provided in the Specifications. The Contractor shall keep the Contract under his own control, and it shall be his responsibility to see that the Work is properly supervised and carried on faithfully and efficiently. The Contractor shall supervise the work personally or shall have a competent English-speaking superintendent or representative, who shall be on the site of the project at all working hours and who shall be empowered with full authority by the Contractor to direct the performance of the Work and make arrangement for all necessary materials, equipment, and labor without delay.

B. Renewals or repairs required because of defective materials or workmanship or due to the action of the elements or other natural causes, including fire and flood, before the acceptance as determined by the Completion Certificate, shall be done in accordance with the Contract and Specifications at the expense of the Contractor.

1.28 CONSTRUCTION CONDITIONS AND SUBSURFACE INVESTIGATION

A. The Contractor shall strictly adhere to the specific requirements of the governmental unit(s) or agency(ies) having jurisdiction over the Work. Wherever there is a difference in the requirements of a jurisdictional body and these Specifications, the more stringent shall apply.

B. The Contractor shall be responsible for having determined to his satisfaction, before submitting his bid, the nature and location of the Work, the conformation of the ground, the character and quality of the substrata, the types and quantity of materials to be encountered, the nature of the groundwater conditions, the character of equipment and facilities needed before and during the execution of the Work, the general and local conditions, and all other matters which can in any way affect the Work under this Contract. The prices established for the work to be done will reflect all costs pertaining to the Work. Any claims for extras based on substrata, groundwater table, and other such conditions will not be allowed.

1.29 SUSPENSION OF WORK DUE TO WEATHER

A. During inclement weather, all work which might be damaged or rendered inferior by such weather conditions shall be suspended. The orders and decisions of the Engineer as to suspensions shall be final and binding. The ability to issue such an order shall not be interpreted as a requirement to do so. During suspension of the work from any cause, the Work shall be suitably covered and protected so as to preserve it from injury by the weather or otherwise, and if the Engineer shall so direct, the rubbish and surplus materials shall be removed.

1.30 PERMITS

A. Upon notice of award, the Contractor shall immediately apply for all applicable permits not previously obtained by the Owner to do the Work from the appropriate governmental agency or agencies. No work shall begin until all applicable permits have been obtained and copies delivered to the Engineer. The Contractor shall bear all costs for obtaining all permits.

1.31 PUMPING

A. The Contractor with his own equipment shall do all pumping necessary to prevent flotation of any part of the structures during construction operations.

B. For the duration of the Contract and with his own equipment, the Contractor shall pump out water and wastewater which may seep or leak into the excavations or structures. Galleries and other operating areas shall be kept dry at all times. The

Engineer will determine the extent of pumping required in the tanks, channels, and other non-operating areas.

1.32 OWNER OCCUPANCY AND OPERATION OF COMPLETED FACILITIES

A. It is assumed that portions of the Work will be completed before the entire work is completed. Upon completion of construction in each individual facility, including testing, if the Owner, at its sole discretion, desires to accept the individual facility, the Contractor will be issued a dated certificate of completion and acceptance for each individual facility. The Owner will assume ownership and begin operation of the individual facility on that date and the 1-year guaranty period shall begin on that date. The Owner has the option of not accepting any individual completed facility, but accepting the entire work as a whole when it is completed and tested.

1.33 CLAIMS FOR PROPERTY DAMAGE

A. Upon notification by the Owner or Engineer, the Contractor shall investigate each claim for property damage and shall file, within 10 days of such notification, a statement with the Owner or Engineer setting forth all facts and details relative to the claim.

1.34 DAILY REPORTS

A. The Contractor shall submit daily reports of construction activities, including non-workdays. The report shall include the following:

1. Manpower, number of workers by craft.
2. Equipment on the project.
3. Major deliveries.
4. Activities work with reference to the CPM schedule activity numbers.
5. New problems.
6. Other pertinent information.

B. A similar report shall be submitted for/by each subcontractor.

C. The reports shall be submitted to the Engineer’s Field Office within 2 days of the respective report date. Each report shall be signed by the Contractor’s Superintendent or Project Manager.

1.35 CONNECTIONS TO EXISTING SYSTEMS

A. The Contractor shall perform all work necessary to locate, excavate, and prepare for connections to the terminus of the existing systems all as shown on the

Drawings or where directed by the Engineer. The cost of this work and for the actual connection of the existing mains shall be included in the bid for the Project and shall not result in any additional cost to the Owner.

1.36 COORDINATION OF WORK

A. Because of the nature of this Project, the Contractor should expect other construction to occur in the vicinity of this Project during the Contract. In such instances the Contractor will be required to cooperate fully to eliminate or minimize the creation of conflicts. Adjustments from time to time may be required in the Contractor's work location and/or schedule provided a reasonable notice is given by the Owner or Engineer.

B. The Contractor shall afford other contractors and the Owner reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work and shall properly connect and coordinate the Work with such other work. The Contractor shall coordinate his Work with the Owner and other contractors to store his apparatus, materials, supplies, and equipment in such orderly fashion at the site of the Work so that it will not unduly interfere with the progress of the Work or the work of any other contractors.

C. If the execution or result of any part of the Work depends on any work of the Owner or of any separate contractor, the Contractor shall, before proceeding with the Work, inspect and promptly report to the Owner in writing any apparent discrepancies or defects in such work of the Owner or of any separate contractor that render it unsuitable for the proper execution or result of any part of the Work.

D. Failure of the Contractor to inspect and report any deficiencies shall constitute an acceptance of the Owner's or separate contractor's work as fit and proper to receive the Work, except as to defects which may develop in the Owner's or separate contractor's work after completion of the Work and which the Contractor could not have discovered by his inspection before the Work was completed.

E. If the Contractor damages the work or property of the Owner or of any separate contractor on the Project or other work on the Site, or delays or interferes with the Owner's work on ongoing operations or facilities or adjacent facilities or the separate contractor's work, the Contractor shall be liable for damage caused, and, in the case of another contractor, the Contractor shall attempt to settle the claim with the other contractor before the other contractor institutes litigation or other proceedings against the Contractor.

F. If a separate contractor sues the Owner on account of any damage, delay, or interference caused or alleged to have been caused by the Contractor, the Owner shall notify the Contractor, who shall defend the Owner in such proceedings at the

Contractor's expense. If any judgment or award is entered against the Owner, the Contractor shall satisfy the same and shall reimburse the Owner for all damages, expenses, attorneys' fees, and other costs which the Owner incurs as a result of the judgment or award.

G. If a separate contractor causes damage to the Work or to the property of the Contractor or causes delay or interference with the Contractor's performance of the Work, the Contractor shall present directly to the separate contractor any claims it may have as a result of such damage, delay, or interference (with an information copy to the Owner) and shall attempt to settle its claim against the separate contractor before instituting litigation or other proceedings against the separate contractor.

H. In no event shall the Contractor seek to recover from the Owner or the Engineer, and the Contractor hereby represents to the Owner and the Engineer that he will not seek to recover from them, or either of them, any costs, expenses, (including, but not limited to, attorneys' fees) or losses of profit incurred by the Contractor as a result of any damage to the Work or property of the Contractor or any delay or interference caused or allegedly caused by any separate contractor.

I. The Engineer shall determine and adjust any difference or conflict which may arise between the Contractor and other contractors who may be performing work on behalf of the Owner or between the Contractor and workmen of the Owner in regard to their work. If the work of the Contractor is delayed because of any acts of omissions of any other contractor of the Owner, the Contractor shall on that account have no claim against the Owner other than for an extension of time.

1.37 FINAL GUARANTEE

A. The Contractor shall guarantee all work for 1 year from the date of Substantial Completion of the Work by the Owner.

B. If, within the guarantee period, repairs or changes are required in connection with guaranteed work, which, in the opinion of the Engineer, are rendered necessary as the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, the Contractor shall do the following promptly upon receipt of notice from the Owner and without expense to the Owner:

1. Place in satisfactory condition in every way all such guaranteed work and correct all defects in the guaranteed work.
2. Make good all damage to the building or site, or equipment or piping, or their contents, which, in the opinion of the Engineer, is the result of the

use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the contract.

3. Make good any work or material or the equipment and contents of the building, structure, or site disturbed in fulfilling any such guarantee.

C. If the Contractor, after notice, fails to proceed to comply with the terms of this guarantee within 10 days, the Owner may have the defects corrected and the Contractor and his surety shall be liable for all expenses incurred provided. However, that in case of an emergency where, in the opinion of the Owner, delay would cause loss or damage, repairs may be started without notice being given to the Contractor and the Contractor shall pay the cost of such repairs.

D. All special guarantees or warranties applicable to specific parts of the Work as may be stipulated in the Contract Specifications or other papers forming a part of this Contract shall be subject to the terms of this Paragraph during the first year of life of each such guarantee. The Contractor shall assemble all special guarantees and manufacturers' warranties, along with a summary list of the special guarantees and warranties, and deliver these to the Engineer before the Work is accepted.

1.38 AUTOMATICALLY CONTROLLED EQUIPMENT

A. Whenever batching or mixing plant equipment is required to be operated automatically under the Contract and a breakdown or malfunction of the automatic controls occurs, the equipment may be operated manually or by other methods for 48 hours after the breakdown or malfunction, provided this method of operation will produce results otherwise meeting the Specifications.

1.39 EQUIPMENT DATA FORMS

A. The Contractor shall obtain, prepare, and submit a complete, detailed listing of equipment and motor data for all electrical items furnished under this Contract. This listing shall be submitted with the preliminary draft of Operations and Maintenance Data Manuals on Equipment Data sheets and the Equipment Manufacturer’s Certificate of Installation, Testing, and Instruction and the Manufacturer’s Certificate of Compliance forms.

1.40 RIGHTS IN AND USE OF MATERIALS FOUND ON THE WORK

A. With the approval of the Engineer, the Contractor may use on the project such stone, gravel, sand, or other material determined suitable by the Engineer as may be found in the excavation and will be paid both for the excavation of such materials at the corresponding Contract unit price and for the pay item for which the excavated material is used. The Contractor shall replace at his own expense,

with other acceptable material, all of that portion of the excavation materials so removed and used which were needed for use in the embankments, backfills, approaches, or otherwise. No charge for the materials used will be made against the Contractor.

1.41 OWNER-FURNISHED MATERIAL

A. The Contractor shall furnish all materials required to complete the Work. No materials will be furnished by the Owner.

1.42 MAINTENANCE AND LUBRICATION SCHEDULES

A. The Contractor's attention is directed to Section 01830, Operations and Maintenance Manuals, for requirements relative to the submission of operating and maintenance data for the mechanical equipment. For all mechanical and electrical equipment furnished, the Contractor shall provide a list including the equipment name, address, and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.

1.43 INSTALLATION LISTS

A. All manufacturers or equipment suppliers who propose to furnish equipment or products under the Contract Documents shall submit an installation list to the Engineer along with the required Shop Drawings.

B. The installation list shall include all installation where identical equipment has been installed and has been in operation for at least 1 year.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01400
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. General

1. This Section defines minimum requirements for the Quality Assurance (QA) Program to be provided by the Contractor. The deliverable documents are defined, along with the method of execution of the QA Program.
2. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with the Contract Document requirements.
3. Specified tests, inspections, and related actions do not limit the Contractor's Quality Control (QC) procedures that facilitate compliance with the Contract Documents.

B. Definitions

1. Quality Assurance services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with Contract requirements.
2. Quality Control services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction comply with requirements.

C. Payment

1. Separate payment will not be made for providing and maintaining an effective Quality Assurance and Quality Control Program, and all costs associated with such a program shall be included in the applicable unit prices, lump-sum prices, or allowances contained in the Contract Price Breakdown.

1.02 WORK SEQUENCE

A. Where reference is made to a particular standard, the revision in effect at the time of Bid opening shall apply except where a specific date is established.

B. For products or workmanship specified by association, trades, or other consensus standards, the Contractor shall comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable code.

C. If specified reference standards conflict with Contract Documents, the Contractor shall request clarification from the Engineer before proceeding.

1.03 QUALITY ASSURANCE

A. The Contractor shall install all materials and equipment in a neat and first-class workman-like manner.

B. The Contractor shall replace all existing paving, stabilized earth, curbs, driveways, sidewalks, fences, signs, and other improvements with the same type of material that was removed during construction or as directed by the Engineer without increase in the Contract Price or Contract Time.

C. The Engineer reserves the right to direct the removal and replacement of any items which, in the Engineer's opinion, do not present an orderly and reasonably neat or workman-like appearance, provided such an orderly installation can be made using customary trade methods. The removal and replacement shall be done when directed in writing by the Engineer at the Contractor's own expense and without additional expense to the Owner.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 TOLERANCES

A. Monitor tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. If manufacturers' tolerances conflict with Contract Documents, request clarification from the Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.07 FIELD SAMPLES

A. The Contractor shall furnish field samples at the site as required by individual Specifications Sections for review.

B. Acceptable samples represent a quality level for the Work.

C. Where field sample is specified in individual Sections to be removed, the Contractor shall clear the area after the field sample had been accepted by the Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor is responsible for quality control and shall establish and maintain an effective QC system in compliance with the Contract Documents. The QC system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the Contract requirements. The system shall cover all Work and shall be keyed to the proposed design and construction sequence. The project QC Officer will be held responsible for the quality of work on the job and is subject to removal by the Engineer for non-compliance with quality requirements specified in the Contract. The project QC Officer in this context shall mean the individual with the responsibility for the overall management of the project quality.

3.02 QUALITY CONTROL PLAN

A. General: Not later than 30 calendar days after receipt of Notice to Proceed, the Contractor shall furnish for review by the Engineer the QC Plan proposed to implement the requirements of the Contract. The Plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. The Engineer will consider an interim plan for the first 30 calendar days of operation.

B. Content of the QC Plan: The QC Plan shall include, at a minimum, the following to cover all construction operations, both on-site and off-site, including work by subcontractors, fabricators, suppliers, and purchasing agents:

1. A description of the quality control organization, including a chart showing lines of authority for all aspects of the Work specified. The staff shall include a Quality Control Officer who shall report to the Project Manager or executive.
2. The name, qualifications (in résumé format), duties, responsibilities, and authorities of each person assigned a QC function.
3. A copy of the letter to the Quality Control Officer signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the Quality Control Officer, including authority to stop work which is not in compliance with the Contract.
4. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, off-site fabricators, suppliers, and purchasing agents.
5. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will verify that identified deficiencies have been corrected.
6. Reporting procedures, including proposed reporting formats.

C. Acceptance of Plan

1. Acceptance of the Contractor's plan is required before the start of Work. Acceptance is conditional and will be predicated on satisfactory performance during the Work. The Engineer reserves the right to require the Contractor to make changes in its QC Plan and operations, including removing personnel as necessary to obtain the quality specified.

D. Notification of Changes

1. After acceptance of the QC Plan, the Contractor shall notify the Engineer in writing of any proposed change. Proposed changes are subject to acceptance by the Engineer.

3.03 SUBMITTALS

A. Submittals shall be made as specified in Section 01330, Submittals and Acceptance. The QC organization shall be responsible for certifying that all submittals are in compliance with the Contract requirements.

3.04 TESTS

A. Testing Services

1. All tests to determine compliance with the Contract Documents shall be performed by an independent commercial testing firm acceptable to the Owner. The testing firm's laboratory shall be staffed with experienced technicians, properly equipped, and fully qualified to perform the tests in accordance with the specified standards.
2. Testing services provided by the Owner are for the sole benefit of the Owner; however, test results shall be available to the Contractor. Testing necessary to satisfy the Contractor's internal Quality Control Procedures shall be the sole responsibility of the Contractor.
3. When necessary, the Contractor shall interrupt its Work for Owner sampling and testing. The Contractor shall have no Claim for increase in Contract Price or Contract Time due to such interruption. The Contractor shall cooperate in these testing activities as needed.
4. Testing, including sampling, will be performed by the testing firm's laboratory personnel in the general manner indicated in the Specifications.

B. Transmittal of Test Reports

1. Written reports of tests and engineering data furnished by the Contractor for the Engineer's review shall be submitted as specified for Shop Drawings.

C. Manufacturer's Field Services (As Applicable)

1. The manufacturer's field services will be specified in the respective Equipment Sections.
2. An experienced, competent, and authorized representative of the manufacturer of each item of equipment for which field services are indicated shall visit the Site of the Work and inspect, check, adjust if necessary, and approve the equipment installation. In each case the manufacturer's representative shall be present when the equipment is placed in operation. The manufacturer's representative shall revisit the Site as often as necessary until any and all trouble is corrected and the equipment installation and operation are satisfactory in the opinion of the Engineer.
3. Each manufacturer's representative shall furnish to the Owner, through the Engineer, a written report certifying that the equipment has been properly installed and lubricated, is in accurate alignment, is free from any undue stress imposed by connecting piping or anchor bolts, has been operated under full load conditions, and has operated satisfactorily.

3.05 COMPLETION INSPECTION

A. Final Completion Punch List: Near the completion of all Work the QC Officer shall inspect the Work and develop a "punch list" of items which do not conform to the approved Drawings and Specifications. Such a list of deficiencies shall be included in the QC documentation and shall include the estimated date by which the deficiencies will be corrected. The QC Officer or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Engineer that the Facility is ready for the Engineer's final inspection.

B. Final Inspection and Acceptance: The Contractor's Quality Control Officer and the Engineer will be in attendance at this inspection. Additional Engineer personnel may also be in attendance. The final acceptance inspection will be formally scheduled by the Engineer when all punch list deficiencies have been corrected. Notice will be given to the Engineer at least 14 days before the final inspection and must include the Contractor's assurance that all punch list items will be complete and acceptable by the date scheduled for the final inspection. Failure of the Contractor to have all Contract Work acceptably complete for this inspection will be cause for noncertification of final payment by the Engineer.

3.06 NOTIFICATION OF NONCOMPLIANCE

A. The Engineer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Engineer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.07 REPAIR AND PROTECTION

A. On completion of testing, inspection, sampling, and similar services, the Contractor shall repair damaged construction and restore substrates and finishes.

B. The Contractor shall protect all construction exposed by or for Quality Control service activities.

C. The repair and protection are the Contractor's responsibilities, regardless of the assignment of responsibility for Quality Control services.

END OF SECTION

SECTION 01450
TESTING AND TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Owner will pay for the costs of all passing laboratory tests required to determine soil density, concrete compressive strength, and bacteriological clearance of water main. The cost of all testing shall be paid for from the Bid Item allowance as stated in the Bid Form. Costs will be determined from direct invoices from the testing laboratory to the Contractor. Failed tests will be back-charged to the Contractor at the time of final payment. All required soil, concrete, and bacteriological water testing shall be coordinated with and scheduled by the Contractor.

1. The Contractor shall cooperate with the laboratory to facilitate the execution of required services.
2. The Owner shall approve the selection of the testing laboratory.
3. Employment of a testing laboratory shall in no way relieve the Contractor of the obligation to perform work in accordance with the requirements of the Contract Documents.

1.02 RELATED WORK

A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders, or approvals of public authorities.

B. Respective Sections: Certification of products.

C. Each Section listed: Laboratory tests required and standards for testing.

D. Testing Laboratory inspection, sampling, and testing are required for but are not limited to the following:

1. Section 02230, Site Preparation.
2. Section 02305, Earthwork for Utilities.
3. Section 02700, Earthwork, Paving, and Markings.
4. Section 03301, Concrete and Reinforcing Steel.
5. Section 15055, Piping Systems—General.
6. Section 15141, Disinfection of Piping and Water Storage Facilities.

1.03 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. Submit to the Engineer for review a list and schedule of all tests to be conducted.

C. Describe test procedures along with duration of tests.

D. After each inspection and test, the Laboratory shall promptly submit two copies of the laboratory report to the Engineer, one copy to the Contractor, and one copy to the Owner.

E. Include the following:

1. Date issued.
2. Project title and number.
3. Name of field testing technician or inspector.
4. Date and time of sampling or inspection.
5. Identification of product and Specifications Section.
6. Location in the Project.
7. Type of inspection or test.
8. Date of test.
9. Results of test.
10. Conformance with Contract Documents.

F. When requested by the Engineer, provide interpretation of test results.

1.04 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM E329—Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
2. ASTM D3740—Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

1.05 QUALITY ASSURANCE

A. The Laboratory is not authorized to do any of the following:

1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of the work.
3. Perform any duties of the Engineer of Record or the Engineer.

B. The Contractor shall be responsible for the following:

1. Cooperating with laboratory personnel, providing access to work and to manufacturer's operations.

2. Securing and delivering to the laboratory adequate quantities of representative samples of materials proposed to be used and which require testing.

3. Providing to the laboratory the preliminary design mix proposed to be used for concrete and other materials mixes which require control by the testing laboratory.

4. Furnishing incidental labor and facilities:

   a. To provide access to work to be tested.
   b. To obtain and handle samples at the project site or at the source of the product to be tested.
   c. To facilitate inspections and tests.
   d. To store and cure test samples.

5. Notifying the Engineer and laboratory sufficiently in advance of operations to allow for the laboratory to assign personnel and schedule tests.

6. Employing and paying for the services of the same or a separate, equally qualified independent testing laboratory to perform additional inspections, sampling, and testing required for the Equipment Supplier or Contractor's (as applicable) convenience.

C. Materials and equipment used in the performance of Work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. Standard requirements for quality and workmanship are indicated in the Contract Documents. The Engineer may require the equipment supplier or Contractor (as applicable) to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured

or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the Contract Documents. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor, and no extra charge to the Owner shall be allowed on account of such testing and certification.

D. If the test and any subsequent retest results indicate that the materials or equipment fail to meet the requirements of the Contract Documents, the equipment supplier or Contractor (as applicable) shall pay for the laboratory costs directly to the testing firm and these will not be reimbursable to the equipment supplier or Contractor (as applicable).

1.06 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.07 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.08 QUALIFICATIONS

A. Comply with requirements of ASTM E329 and ASTM D3740.

B. Laboratory: Licensed to operate in Florida.

C. Laboratory Staff: Maintain a full-time Professional Engineer registered in Florida on staff to review the services performed under this project.

D. Testing Equipment: Calibrated at reasonable intervals with devices of accuracy traceable to either National Bureau of Standards (NBS) or accepted values of natural physical constants.

E. Provide qualified personnel at the site. Cooperate with the Engineer and Contractor in performing services.

F. Perform specified inspection, sampling, and testing of products in accordance with specified standards.

G. Ascertain compliance of materials and mixes with requirements of Contract Documents.

H. Promptly notify the Engineer and Contractor of observed irregularities or non-conformance of Work or Products.

I. Perform additional inspections and tests required by Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01500
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.02 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.03 RESPONSIBILITY

A. This Section specifies the minimum requirements for temporary facilities, utilities, and controls required to provide an adequate and safe work site at every stage during construction of the Project. The Contractor is solely responsible for the requirements set forth in this Section.

1.04 ONSITE TEMPORARY

A. Except as otherwise indicated, the Contractor may, at his option, furnish stand-alone utility plants to provide needed services in lieu of connected services from available public utilities, provided such stand-alone plant facilities comply with all governing regulations. Before availability of temporary utility services, the Contractor will provide trucked-in/trucked-out containerized or unitized services for start-up of construction operations at the site.

1.05 COSTS

A. Except as otherwise indicated, the costs of providing and using temporary utility services are included in the Contract Sum.

1.06 TEMPORARY FACILITIES

A. The types of utility services required for temporary use at the project site include the following (other specific services may be required for specific construction methods of operations):

1. Electrical Power Service.
2. Water Service (potable for certain uses).
3. Sanitary.
4. Storm Sewer or Open Drainage/Run-off Control.
5. Gas (fuel) Service.
6. Telephone Service.

1.07 TEMPORARY ELECTRICITY

A. The Contractor shall make the necessary applications and arrangements and pay all fees and charges for electrical energy for power and light necessary for proper completion of the Work and during its entire progress up to time of final acceptance by the Owner. The Contractor shall provide and pay for all temporary switches, connections, and meters.

1.08 TEMPORARY WATER

A. The Contractor shall make all necessary application and arrangements and pay all fees and charges for water necessary for the proper completion of the Project up to the time of final acceptance. The Contractor shall provide and pay for any temporary piping and connections.

1.09 TEMPORARY SANITARY FACILITIES

A. The Contractor shall provide adequate sanitary facilities for the use of those employed on the Work. Such facilities shall be made available when the first employees arrive on the site of the Work, shall be properly secluded from public observation, and shall be constructed and maintained during the progress of the Work in suitable numbers and at such points and in such manner as may be required or approved.

1.10 CLEANLINESS OF FACILITIES

A. The Contractor shall maintain the sanitary facilities in a satisfactory and sanitary condition at all times and shall enforce their use. He shall rigorously prohibit the committing of nuisances on the site of the Work, on the lands of the Owner, or on adjacent property.

1.11 TERMINATION AND REMOVAL

A. At the time the need for a temporary utility service has ended or has been replaced by use of permanent services, or not later than the time of final completion, the Contractor shall promptly remove the installation unless requested by the Engineer to retain it for a longer period. Any work which may have been delayed or affected by the installation and use of the temporary utility, including repairs to construction and grades and restoration and cleaning of exposed surfaces, shall be completed at this time. The Contractor shall replace any work damaged beyond acceptable restoration.

1.12 NOISE CONTROL

A. The Contractor shall provide adequate protection against objectionable noise levels caused by the operation of construction equipment.

1.13 DUST CONTROL

A. The Contractor shall provide for adequate protection against raising objectionable dust clouds caused by moving construction equipment, high winds, or any other cause.

1.14 WATER CONTROL

A. The Contractor shall provide for satisfactory disposal of surplus water and shall submit a plan to the Engineer for review before initiating and implementing the plan. Prior approval shall be obtained from the proper authorities for the use of public or private lands or facilities for such disposal.

1.15 POLLUTION CONTROL

A. The Contractor shall provide for adequate protection against polluting any public or private lands, lakes, ponds, rivers, streams, creeks, and other such areas by the disposal of surplus material in the form of solids, liquids, gases, or from any other cause.

1.16 ADVERSE IMPACT

A. The Contractor shall evaluate and assess the impact of any adverse effects on the natural environment which may result from construction operations and shall operate to minimize pollution of air, ground, or surface waters vegetation, and afford the neighboring community the maximum protection during and up to completion of the construction project.

1.17 STREAMS, LAKES, AND OTHER BODIES OF WATER

A. The Contractor shall take sufficient precautions to prevent pollution of streams, lakes, and reservoirs with fuels, oils, bitumens, calcium chloride, or other harmful materials. He shall conduct and schedule his operations so as to avoid or otherwise prevent pollution of siltation of streams, lakes, and reservoirs and to avoid interference with the movements of migratory fish.

1.18 CHEMICALS

A. All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, must show approval of either US EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions.

1.19 EROSION CONTROL

A. The Contractor shall not expose by construction operations a larger area of erosive land at any one time than the minimum necessary for efficient construction operations, and the duration of exposure of the uncompleted construction to the elements shall be as short as practicable. Erosion-control features shall be constructed concurrently with other work and at the earliest practicable time.

1.20 STORAGE FACILITIES

A. All products, materials, and equipment shall be stored in accordance with the manufacturer's instructions, with seals and labels intact and legible. Products subject to damage by the elements shall be stored in weathertight enclosures. Temperature and humidity shall be maintained within the ranges required by the manufacturer's instructions. Fabricated products shall be stored above the ground on blocking or skids. Products which are subject to deterioration shall be covered with impervious coatings with adequate ventilation to avoid condensation. Loose granular materials shall be stored in a well-drained area on solid surfaces to prevent mixing with foreign matter. Any products which will come in contact with water shall be stored off the ground to prevent contamination.

1.21 INSPECTION

A. Storage shall be arranged in such a manner to provide easy access for inspection. Periodic inspections shall be made of all stored products to ensure that they are maintained under specified conditions and free from damage or deterioration.

1.22 TEMPORARY PROTECTION

A. After installation, the Contractor shall provide substantial coverings as necessary to installed products to protect them from damage from traffic and subsequent construction operations. Coverings shall be removed when no longer needed.

1.23 ADJACENT TO WORK

A. The Contractor shall protect from damage all property along the line of the Work or in the vicinity of or in any way affected by the Work, the removal or destruction of which is not called for by the Drawings. Wherever such property is damaged due to the activities of the Contractor, it shall be immediately restored to its original condition by the Contractor at no cost to the Owner.

1.24 REMEDY BY OWNER

A. In case of failure on the part of the Contractor to restore such property or make good such damage or injury, the Owner may, after 48 hours' notice to the Contractor, proceed to repair, rebuild, or otherwise restore such property as may be deemed necessary and the cost of such repairs, rebuilding, or restoration will be deducted from any monies due or which may become due to the Contractor under this Contract.

1.25 PROTECTION FROM DAMAGE

A. The Contractor shall be responsible for protecting property in the areas in the vicinity of the Project and for protecting his equipment, supplies, materials, and work against any damage resulting from the elements, such as flooding, rainstorm, wind damage, or other such damage, and shall be responsible for damage resulting from the same. The Contractor shall provide adequate drainage facilities, tie-downs, or other protection throughout the contract period for the protection of his, the Owner's, and other properties from such damage.

1.26 TRAFFIC REGULATION

A. Signs, marking barricades, and procedures shall conform to the requirements of the Florida Department of Transportation Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System, Index 600 Series, Traffic Control Through Work Zones.

1.27 SIGNAGE

A. The Contractor shall provide and maintain adequate barricades around open excavations.

1.28 REMOVAL OF SIGNAGE

A. On completion of the Work, the Contractor shall remove all debris, excess materials, barricades, and temporary work, leaving walkways and roads clear of obstructions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01600
MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

This Section includes the minimum requirements for the furnished materials and equipment for this project. The more stringent requirements in the Technical Specification sections shall take precedence over these requirements for any conflicts.

A. Materials and equipment furnished by the Contractor shall be new and shall not have been in service at any other installation unless otherwise approved. They shall conform to applicable specifications approved in writing by the Engineer.

B. Manufactured and fabricated products shall be designed, fabricated, and assembled in accordance with the best engineering and shop practices. Like parts of duplicate units shall be manufactured to standard sizes and gauges so as to be interchangeable.

C. Quantities of items that are identical shall be by the same manufacturer, regardless of the Design Package breakdown.

D. Equipment sizes, capacities, and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.

E. Materials and equipment shall not be used for any purpose other than that for which they are designed or specified.

F. Where materials or equipment are specifically shown or specified to be reused in the Work, special care shall be used in removing, handling, storing, and reinstalling to ensure their proper function in the completed Work.

G. Material and Equipment Incorporated Into the Work

1. Shall conform to applicable specifications and standards.

2. Shall comply with size, make, type, and quality specified or as specifically approved in writing by the Engineer.

3. Manufactured and fabricated products:

a. Rotating machinery shall be designed and fabricated to provide satisfactory operation without excessive wear and without excessive maintenance during its operating life. Rotating parts shall be statically and dynamically balanced and shall operate without excessive vibration.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 ACCEPTANCE OF MATERIAL AND EQUIPMENT

A. Only new materials and equipment shall be incorporated in the Work. All materials and equipment furnished by the Contractor shall be subject to the inspection and acceptance of the Engineer. No material shall be delivered to the site that does not meet the Contract Specifications.

B. The Contractor shall submit data and samples sufficiently early to permit consideration and acceptance before materials are necessary for incorporating in the work. Any delay of acceptance resulting from the Contractor's failure to submit samples or data promptly shall not be used as a basis of claim against the Owner.

C. The materials and equipment used in the Work shall correspond to the approved samples or other data.

D. If requested, the Contractor shall be required to submit to the Engineer ample evidence that each and every part of the materials, machinery, and equipment to be furnished is of a reliable make and of a type that has been in successful operation within the continental United States. No equipment will be considered unless the manufacturer has designed and manufactured equipment of a comparable type and size for at least 3 years. The Engineer or Owner will not allow any experimental or untried type of material or machinery to be installed.

E. The equipment specified shall be carefully designed and installed to ensure that it adequately performs all required functions within the specified degree of precision. Each unit shall operate with each of the other parts of the equipment to provide a completely integrated system that shall operate to the satisfaction of the Engineer and Owner.

F. All equipment, machinery, parts, and assemblies of equipment, machinery, or parts entering into the Work shall be tested as specified. Unless waived in writing by the Engineer, all field and operating tests shall be made in the presence of the Engineer or the Engineer's authorized representative. When such a waiver is issued, the Contractor or manufacturer shall furnish sworn statements in duplicate of the tests conducted and the results of the tests to the Engineer.

G. The Contractor shall submit copies of welding procedures for all welding. Welders and welding operators shall be selected in accordance with the qualification requirements of the AWS Code. Welders and welding operators for stainless steel shall pass qualification tests using stainless steel filler metal and procedures developed for stainless steel. Procedures, welder, and operator qualifications shall be certified by an independent testing laboratory retained and paid by the Contractor.

H. The Contractor shall not start fabrication of the Work until the Contractor receives written acceptance of the proof of welding procedures from the Engineer for each type of weld.

I. The Contractor shall submit copies of mill certificate for each type of rolled steel and as required in the Specifications. The Contractor shall not start fabrication of the work until the Contractor receives written acceptance of all mill certificates from the Engineer.

1.05 MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION

A. The equipment installation details shall suit the existing and furnished equipment and are subject to acceptance by the Engineer.

B. Any changes or revisions made necessary by the type and dimensions of the equipment furnished shall be made at the expense of the Contractor who shall furnish detailed drawings showing such changes or revision for the acceptance of the Engineer.

C. The installation of all work shall comply with the manufacturer's printed instructions. The Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including six copies to the Engineer for

distribution. One complete set of instructions shall be maintained at the job site during installation and until the Project is complete.

D. All products and equipment shall be handled, installed, connected, cleaned, conditioned, and adjusted in accordance with the manufacturer's instructions and specified requirements. Should job conditions or specified requirements conflict with the manufacturer's instructions, such conflicts shall be called to the Engineer's attention for resolution and revised instructions.

E. The Contractor shall perform work according to the manufacturer's instructions and not omit any preparatory step or installation procedure unless the instructions are specifically modified or the step or procedure exempted by the Contract Documents.

1.06 INSTALLATION OF EQUIPMENT

A. The cost of the Work shall include the cost of competent manufacturers' representatives of all equipment to supervise the installation, adjustment, and testing of the equipment and to instruct the Owner's operating personnel on operation and maintenance.

B. A certificate from the manufacturer stating that the installation of the equipment is satisfactory, that the unit has been satisfactorily tested, is ready for operation, and that the operating personnel have been suitably instructed in the operation, lubrication, and care of the unit shall be submitted before Substantial Completion.

C. The Contractor shall furnish the service of competent manufacturers' representatives for Contractor- or Owner-furnished equipment when evident malfunction or over-heating makes such services necessary or as determined by the Engineer. All such equipment shall be installed by skilled mechanics and in accordance with the instructions of the manufacturer.

D. Special care shall be taken to ensure proper alignment of all equipment with particular reference to mechanical equipment such as pumps and electric drives. These units shall be carefully aligned on their foundations by qualified millwrights after their sole or base plates have been shimmed to true alignment at the anchor bolts. The anchor bolts shall be set in place and the nuts tightened against the shims. After the manufacturer has approved the foundation alignments, the bedplates or wing feet of the equipment shall be securely bolted in place. The alignment of equipment shall be further checked after securing to the foundations. After all alignments are confirmed, the sole or base plates shall be finally grouted in place. The Contractor shall be responsible for the exact alignment of equipment with associated piping, and under no circumstances, will

"pipe springing" be allowed. Special installation requirements in the Technical Specifications shall take precedence over the requirements of this Section.

E. The Contractor shall furnish all wedges, shims, filling pieces, keys, packing, grout, or other materials necessary to properly align, level, and secure an apparatus in place. All parts intended to be plumb or level must be proven exactly so. Any grinding necessary to bring parts to proper alignment after erection shall be done at the expense of the Contractor.

F. The Contractor shall furnish the necessary materials and construct suitable concrete foundations or pads for all equipment installed by the Contractor, even though such foundations or pads may not be indicated on the Drawings. The tops of foundations shall be at such elevations as will permit grouting.

G. In setting pumps, motors, and other items of equipment customarily grouted, the Contractor shall make an allowance of at least 1 inch (2.54 cm) for grout under the equipment bases. Shims used to level and adjust the bases shall be steel. Shims may be left embedded in the grout, in which case they shall be installed neatly and so as to be as inconspicuous as possible in the completed work. Unless otherwise permitted, all grout shall be a suitable non-shrinking grout.

1. Grout shall be mixed and placed in accordance with the recommendations of the manufacturer. Where practicable, the grout shall be placed through the grout holes in the base and worked outward and under the edges of the base and across the rough top of the concrete foundation to a peripheral form so constructed as to provide a suitable chamber around the top edge of the finished foundation.
2. Where such procedure is impracticable, the method of placing grout shall be as permitted. After the grout has hardened sufficiently, all forms, hoppers, and excess grout shall be removed, and all exposed grout surfaces shall be patched in an approved manner and, if necessary, as required by the Engineer, given burlap-rubbed finish, and painted with at least two coats of an acceptable paint.

1.07 SPECIAL TOOLS

A. Manufacturers of equipment and machinery shall furnish two sets of any special tools (including grease guns or other lubricating devices) required for normal adjustment, operations and maintenance, and disassembly, together with instructions for their use. The Contractor shall preserve and deliver to the Owner these tools and instructions in good order before completing the Contract. Tools shall be high-grade, smooth, forged, alloy tool steel. Grease guns shall be lever-type.

B. Special tools are considered to be those tools which because of their limited use are not normally available, but which are necessary for the particular equipment.

C. Special tools shall be delivered at the same time as the equipment to which they pertain. The Contractor shall properly store and safeguard such special tools until completion of the work, at which time they shall be delivered to the Owner.

1.08 LUBRICATION SYSTEM

A. The minimum design criteria for lubricating moving parts of the equipment shall include 1 week of continuous operation during which no lubricants shall be added to the system.

B. The system shall be designed to receive lubricants whether in operation or shut down and shall not leak or waste lubricants under either condition. The manufacturer's recommendations of grade and quality and a supply of the lubricants so recommended in quantities sufficient to conduct start-up and testing operations shall be furnished with the equipment.

1.09 TESTS AND TEST REPORTS

A. When used in the Contract Documents, "Factory/Fabricating Shop Performance, Evaluation, Certification, and/or Acceptance Tests and Test Reports" shall be considered to mean the corresponding manufacturer’s, fabricator's, and/or other builder's official test and tests reports. Included in these test reports shall be appropriate substantiating documentation/data ascertaining the correct and complete manufacture, fabrication, and "shop performance" (to the greatest extent normally practicable) of the particular material, equipment, system, and/or facilities proposed for eventual delivery. These are subdivided into three significant tests and test report types: 1) Certification Tests and Test Reports, 2) Factory Tests and Test Reports, and 3) Shop Performance/Evaluation Tests and Test Reports. Minimal requirements are described below.

B. Certification Tests and Test Reports

1. Standard specifications, code references, etc. for minimum quality and workmanship levels are indicated in the Contract Documents and Construction Documents. Statements, certificates, and other substantiating reporting data, called "Certification Test Reports" in this Section, of tests conducted on previously manufactured materials or equipment identical to that proposed for use shall be compiled by the Contractor.
2. At a minimum all Certification Test Reports shall contain an official analysis of sufficient material composition or show evidence of meeting or exceeding the specified material standard(s) referenced, e.g., ASTM,

ASME, or other designations. All reports shall also indicate from whom the material was/will be purchased.

3. The Contractor shall pay all costs of certification tests and test reports.

C. Factory Tests and Test Reports

1. Additional tests and reports performed on material or equipment by the manufacturer or fabricator to ascertain quality or workmanship are referred to here as "Factory Tests and Test Reports."
2. Before the delivery of any Factory Test Report, the Contractor shall first submit for review and approval a detailed description of the proposed testing, including reporting procedure and criteria. Such descriptions shall also be delivered to the Engineer for review as part of the first submission of the technical submittal.
3. Materials and equipment used in the performance of the Work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. If Work to be accomplished away from the construction site is to be inspected on behalf of the Owner during its fabrication or manufacture, the Contractor shall give prior notice to the Engineer of the place and time where such fabrication or manufacture is to be done. Such notice shall be in writing and delivered to the Engineer not less than 30 days before the Work is to be done so that the necessary arrangements for the particular factory inspection tests can be made.
4. Upon completion of the factory inspection tests and immediately following manufacture or fabrication, the Contractor shall compile a complete Factory Test Report following the approved format above. All such reports shall be delivered to the Engineer for review as part of the technical submittal corresponding to such tested material or equipment.

D. Shop Performance/Evaluation Tests and Test Reports

1. Material and equipment used in the performance of the Work of this Contract are also subject to evaluation and testing after the complete full-scale assembly into major equipment and/or systems. Shop Performance/ Evaluation Tests, i.e., tests of simulated startup, steady-state, variable loading, and other normal operating conditions, for such assembled equipment/systems shall be accomplished in strict accordance with the standard testing practices specified or otherwise accepted by the Engineer.
2. Before the delivery of any Shop Performance/Evaluation Test Report, the Contractor shall submit for review a detailed description of the proposed performance/evaluation tests, including anticipated reporting procedures, data reduction, and criteria used. Where appropriate, such descriptions shall also be delivered to the Engineer for review as part of a first or subsequent submission of the technical submittal.

3. Should such performance/evaluation tests be accomplished away from the construction site, the Contractor shall give prior notice to the Engineer of the places and times where such tests will be accomplished. Such prior notice shall be in writing and delivered not less than 30 days before such events so that necessary arrangements for the particular tests can be made.
4. The requirements above pertaining to Factory Tests and Test Reports shall be incorporated for shop Performance/Evaluation Tests and Test Reports. Unless factory tests are coincident with shop performance tests and vice versa for the same material or equipment, a minimum of 15 days shall be scheduled between such multiple equipment tests where extended travel is required.

E. Cost of Performance Shop Tests

1. The Contractor shall conduct shop performance full-scale tests at its expense on all equipment as specified. Each piece of equipment shall be tested completely assembled and the shop tests performed by the equipment manufacturer until successful tests are achieved.
2. If the performance tests are conducted outside the continental United States, the Contractor shall pay all transportation expenses incurred by the Owner’s representatives in witnessing the tests at no additional cost to the Owner.

1.10 FIELD TESTING

A. Field-testing shall be conducted when called for in the Technical Specification Sections and on all completed systems in general. The Contractor shall provide services of a factory-authorized service representative to perform, approve, and certify the field testing specified in this Section. Field testing shall generally consist of performing the pre-startup and startup tests and the final mechanical performance test as specified in the Contract Documents. The Contract Documents may require the Contractor to perform factory testing on equipment items before the Engineer approves their use for this project. The Contractor shall refer to the Contract Documents regarding equipment shop testing requirements.

B. After completing the installation, the Contractor shall test the system in the presence of the Engineer and under actual operating conditions. Tests shall be performed according to the manufacturer's recommendations.

C. The Contractor shall include with its bid the services of the equipment manufacturer's field service technician for a period necessary to complete the Work to the satisfaction of the Engineer and the Owner.

D. This service shall be for the purposes of checkout, initial start-up, certification, and instruction of facilities personnel.

E. A written report covering the technician's findings and installation approval shall be submitted to the Engineer covering all inspections and outlining in detail any deficiencies noted.

1.11 ACCEPTANCE OF INSTALLATION

A. The Engineer may accept an equipment system installation as ready for Substantial Completion when:

1. The Engineer has accepted all factory tests and all other component testing.
2. The Engineer has accepted all performance shop tests.
3. All components of the system are installed and tested, including without limitation hydrostatic tests, leak tests, continuity tests, insulation resistance tests, phase rotation tests, bump tests, stroke testing, calibration, adjustment for proper operation, and all other component tests as appropriate.
4. Field start-up activities have been completed and approved by the Engineer.
5. The appropriate certificates have been submitted.
6. All equipment has met the performance requirements.
7. The Engineer has accepted integrated system tests and adjustments performed by the Contractor to demonstrate that the system as a whole functions reliably and meets the performance requirements, in manual and automatic modes, without failure, fault, or defect of any component or of the system as a whole.
8. The Engineer has accepted integrated facilities tests performed by the Contractor to demonstrate that the entire Construction functions together reliably as an integrated facility and meets the performance requirements, in manual and automatic modes, without failure, fault, or defect of any component.
9. The Engineer has accepted facilities performance tests which demonstrate that the design criteria and performance criteria are met.
10. The Engineer has accepted the O&M Manuals.
11. All required Owner personnel have been trained.
12. All other Contract requirements for Substantial Completion have been satisfied.

1.12 GREASE, OIL, AND FUEL

A. All grease, oil, and fuel required for start-up and testing of equipment shall be furnished with the respective equipment.

B. The Contractor shall be responsible for changing the oil in all drives and intermediate drives of each mechanical equipment from after initial break-in of the equipment, which shall be no greater than 30 days.

1.13 ELECTRICAL EQUIPMENT ENCLOSURES

A. All items of electrical equipment that are furnished with process, heating, ventilating, or other equipment shall conform to the requirements as applicable. Enclosures for electrical equipment, such as switches and starters, shall conform to the requirements as applicable.

1.14 EQUIPMENT DRIVE GUARDS

A. Screens, guards, or cages shall be provided for all exposed rotating or moving parts in accordance with accepted practices of applicable governmental agencies. Unless specified otherwise in the technical sections, guards shall be constructed of galvanized sheet steel or galvanized woven wires or expanded metal set in a frame of galvanized steel members. Guards shall be secured in position by steel braces or straps, which will permit easy removal for servicing the equipment.

1.15 PROTECTION AGAINST ELECTROLYSIS

A. Where dissimilar metals are used in conjunction with each other, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous-impregnated felt, heavy -bituminous coatings, nonmetallic separators or washers, or other acceptable materials.

1.16 CONCRETE INSERTS

A. Concrete inserts for hangers shall be designed to support safely, in the concrete that is used, the maximum load that can be imposed by the hangers used in the inserts. Inserts for hangers shall be of a type which will permit adjustment of the hangers both horizontally (in one plane) and vertically and locking of the hanger head or nut. All inserts shall be galvanized.

1.17 SLEEVES

A. Unless otherwise indicated on the Drawings or specified, openings for the passage of pipes through floors and walls shall be formed of sleeves of standard-weight, galvanized-steel pipe. Each sleeve shall be of ample diameter to pass the pipe and its insulation, if any, and to permit such expansion as may occur. Sleeves shall be of sufficient length to be flush at the walls and the bottom of the slabs and to project 2 inches above the finished floor surface. Threaded nipples shall not be used as sleeves.

B. Sleeves in exterior walls below ground or in walls to have liquids on one or both sides shall have a 2-inch annular fin of 1/4-inch plate welded with a continuous weld completely around the sleeve at about mid-length. Sleeves shall be galvanized after the fins are attached.

C. All sleeves shall be set accurately before the concrete is placed or shall be built-in accurately as the masonry is being built.

1.18 SERVICES OF MANUFACTURER'S REPRESENTATIVE

A. The Contractor shall arrange for a qualified service representative from each company manufacturing or supplying certain equipment as listed in this Section (or in the respective Technical Specification sections) to perform the duties described in this Section.

B. After the listed equipment has been installed and the equipment is presumably ready for operation but before it is operated by others, the representative shall inspect, operate, test, and adjust the equipment. The inspection shall include but not be limited to the following points as applicable:

1. Soundness (without cracked, abraded, or otherwise damaged parts).
2. Completeness in all details, as specified.
3. Correctness of setting, alignment, and relative arrangement of various parts.
4. Adequacy and correctness of packing, sealing, and lubricants.

C. The operation, testing, and adjustment shall be as required to prove that the equipment is left in proper condition for satisfactory operation under the conditions specified.

D. On completion of his or her work, the manufacturer's or supplier's representative shall submit in triplicate to the Engineer a complete, signed report of the result of the inspection, operation, adjustments, and tests. The report shall include detailed descriptions of the points inspected, tests and adjustment made, quantitative

results obtained if such are specified, and suggestions for precautions to be taken to ensure proper maintenance. The report also shall include a certificate that the equipment conforms to the requirements of the Contract and is ready for permanent operation and that nothing in the installation will render the manufacturer's warranty null and void.

E. After the Engineer has reviewed the reports from the manufacturer's representatives, the Contractor shall make arrangements to have the manufacturer's representatives present when the field acceptance tests are made.

F. The Contractor, at a minimum, shall arrange for the service of qualified service representatives from the companies manufacturing or supplying the following equipment and as required in the Technical Specifications:

1. Pumping Equipment.
2. Instrumentation and Control Systems.
3. Programmable Controllers.
4. Hoisting Equipment.
5. Electric Motors.
6. Motor Control Centers.
7. Flow Meters.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01650
DELIVERY, STORAGE, AND HANDLING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section specifies the general requirements for the delivery, handling, storage, and protection of all items required in the construction of the Work. Specific requirements, if any, are specified with the related item.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in this Section for storing and protecting the items.

B. The Contractor shall do the following:

1. Materials and equipment shall be loaded and unloaded by methods affording adequate protection against damage. Every precaution shall be taken to prevent injury to the material or equipment during transportation and handling. Suitable power equipment shall be used and the material or equipment shall be under control at all times. Under no condition shall the material or equipment be dropped, bumped, or dragged. When a crane is used, a suitable hook or lift sling shall be used. The crane shall be so placed that all lifting is done in a vertical plane. Materials or equipment skid loaded, palletized, or handled on skidways shall not be skidded or rolled against material or equipment already unloaded.

2. Material and equipment shall be delivered to the job site by means that will adequately support it and not subject it to undue stresses. Material and equipment damaged or injured in the process of transportation unloading or handling shall be rejected and immediately removed from the site.

3. The Contractor shall coordinate the delivery of all materials, including those furnished by the Owner. The Contractor shall be responsible for the proper transport, handling, and storing of all materials, and materials shall be protected to ensure their expected performance. Delivery schedules

shall be coordinated by the Contractor, in advance, so that the Work will be done in a timely manner.

4. The Contractor shall coordinate deliveries of products with construction schedules to avoid conflict with work and conditions at the site. The Contractor shall also do the following:

    a. Deliver products in undamaged condition, in the manufacturer's original containers or packaging, with identifying labels intact and legible.
    b. Immediately on delivery, inspect shipments to ensure compliance with requirements of the Contract Documents and approved submittals and to ensure that the products are properly protected and undamaged.

5. The Contractor shall provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

6. All materials and equipment shall be stored on-site in complete compliance with the manufacturer’s recommendations.

7. Store products subject to damage by the elements in weather-tight enclosures.

8. Maintain temperature and humidity within the ranges required by the manufacturer's instructions.

9. Store fabricated products above the ground, on blocking or skids to prevent soiling or staining. Cover products that are subject to deterioration with impervious sheet coverings, and provide adequate ventilation to avoid condensation.

10. All materials and equipment to be incorporated in the Work shall be handled and stored by the Contractor before, during, and after shipment in a manner that will prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft, or damage of any kind to the material or equipment.

11. All materials which, in the opinion of the Engineer, have become so damaged as to be unfit for the use intended or specified shall be promptly removed from the site of the Work, and the Contractor shall receive no compensation for the damaged material or its removal.

12. The Contractor shall arrange storage in a manner to provide easy access for inspection and make periodic inspections of stored products to ensure that products are maintained under specified conditions, free from damage or deterioration.

13. The Contractor shall provide substantial coverings as necessary to protect installed products from traffic damage and subsequent construction operations and shall remove these coverings when they are no longer needed.

14. Should the Contractor fail to take proper action on storage and handling of equipment supplied under this Contract, within 7 days after written notice to do so has been given, the Owner retains the right to correct all deficiencies noted in the previously transmitted written notice and deduct the cost associated with these corrections from the Contractor's Contract. These costs may include expenditures for labor, equipment use, administrative, clerical, engineering, and any other costs associated with making the necessary corrections.

15. Schedule delivery to reduce long-term onsite storage before installation and/or operation. Under no circumstances shall equipment be delivered to the site more than 1 month before installation without written authorization from the Engineer.

16. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged, or sensitive to deterioration.

17. Deliver products to the site in the manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting, and installing.

18. Unload and place all items delivered to the site in a manner which will not hamper normal construction operation nor that of subcontractors and other contractors and will not interfere with the flow of necessary traffic.

19. Provide necessary equipment and personnel to unload all items delivered to the site.

20. The Contractor shall store and protect products in accordance with the manufacturer's instructions, with seals and labels intact and legible. Follow storage instructions, review them with the Engineer, and keep a written record of this. Arrange storage to permit access for inspection.

21. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

22. Store cement and lime under a roof and off the ground and keep it completely dry at all times. All structural, miscellaneous, and reinforcing steel shall be stored off the ground or otherwise to prevent accumulations of dirt or grease and in a position to prevent accumulations of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping, or cracking. Handle and store brick, block, and similar masonry products in a manner to keep breaking, cracking, and spilling to a minimum.

23. Store all mechanical and electrical equipment and instruments subject to corrosive damage by the atmosphere if stored outdoors (even though covered by canvas) in a weathertight building to prevent damage. The building may be a temporary structure on the site or elsewhere, but it must be satisfactory to the Engineer. The building shall be provided with adequate ventilation to prevent condensation. The Contractor shall ensure that temperature and humidity are maintained within the range required by the manufacturer.

    a. All equipment shall be stored fully lubricated with oil, grease, and other lubricants unless otherwise instructed by the manufacturer.
    b. Moving parts shall be rotated a minimum of once weekly to ensure proper lubrication and to avoid metal-to-metal "welding." Upon installation of the equipment, the Contractor shall start the equipment, at least at half load, once weekly for an adequate period to ensure that the equipment does not deteriorate from lack of use.
    c. Lubricants shall be changed when installation is complete and as frequently as required thereafter during the period between installation and acceptance. The Contractor shall put new lubricants into the equipment at the time of acceptance.
    d. Before accepting equipment that has been stored for some time, the Contractor shall have the manufacturer inspect the equipment and certify that its condition has not been detrimentally affected by the long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested, and accepted in a minimum time period. As such, the manufacturer will guarantee the equipment equally in both instances. If such a certification is not

given, the equipment shall be judged to be defective. It shall be removed and replaced at the Contractor's expense.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01720
FIELD ENGINEERING

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall do the following:

A. Provide and pay for the following field engineering services required for the Project:

1. Survey work required in the execution of the Project.
2. Civil, structural, or other professional engineering services specified or required to execute the Contractor’s construction methods.

B. Retain the services of a registered land surveyor licensed in Florida to do the following:

1. Identify existing control points and property line corner stakes as required.
2. Verify all existing structure locations and all proposed structure corner locations, tank locations, and equipment locations within the Project site.
3. Maintain an accurate location of all buried piping 4 inches in diameter and larger.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. The Contractor shall submit to the Engineer the name and address of the registered land surveyor or professional engineer.

C. On request of the Engineer, the Contractor shall submit documentation to verify the accuracy of field engineering work.

D. The Contractor shall submit a certificate signed by a registered land surveyor certifying that elevations and locations of improvements are in conformance or non-conformance with Subcontract Documents.

E. At the end of the Project and before final payment, submit the certified drawings listed below with the Surveyor's title block (signed and sealed by the registered

land surveyor) of the items listed below. These drawings shall be included with and made a part of the project record documents.

1. Certified site survey at 1-inch = 10-foot scale on sheets 24 inches by 36 inches, indicating the building corners, sidewalks, paved areas, and location of all above-ground structures for the project site.
2. Certified drawing showing the location, lines, and grades of all lines 4 inches in diameter and larger buried and exterior to buildings and other buried facilities (e.g., valves, tanks, vaults) installed as a result of the work. This shall be at the same scale as the Engineer's yard piping drawing and submitted on reproducible tracing paper.
3. Certified drawings showing elevations of all flow control points such as weirs, elevations of all existing and new structures, and equipment.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. All work will be performed in accordance with the Minimum Technical Standards set forth by the Board of Professional Surveyors and Mappers.

1.04 QUALITY ASSURANCE

A. Existing basic horizontal and vertical control points for the project are those designated on Drawings.

B. Locate and protect control points before starting site work and preserve all permanent reference points during construction:

1. Make no changes or relocations without prior written notice to the Engineer.
2. Report to the Engineer when any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.
3. Require the surveyor to correctly replace project control points which may be lost or destroyed.
4. Establish replacements based on original survey control.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 QUALIFICATIONS

A. Registered land surveyor of the discipline required for the specific service on the project, currently licensed in Florida.

1.08 SYSTEM DESCRIPTION

A. The Contractor shall establish a minimum of five (5) permanent benchmarks on the site, referenced to data established by survey control points:

1. Record locations, with horizontal and vertical data, on Record Documents.

B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:

1. Site improvements:

a. Stakes for grading, fill, and topsoil placement.
b. Utility slopes and invert elevations.

2. Foundation and floor levels.

3. Controlling lines and levels required for mechanical and electrical trades.

C. From time to time, verify layouts by the same methods.

D. Maintain a complete and accurate log of all control and survey work as the work progresses.

E. As a condition for approval of monthly progress payment requests, update the project record drawings monthly based on the work performed during the month ending at the pay request. The Contractor shall coordinate this monthly with the Owner's representative on the site as part of the pay request.

F. Maintain an accurate record of piping changes, revisions, and modifications.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01740
FINAL CLEANING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall execute cleaning during progress of the Work and at the completion of the Work as required by General Conditions.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 ENVIRONMENTAL CONCERNS

A. Cleaning and disposal operations shall comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 PRODUCTS

2.01 CLEANING MATERIALS

The Contractor shall do the following:

A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by the manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by the cleaning material manufacturer.

PART 3 EXECUTION

3.01 PERIODIC CLEANING

The Contractor shall do the following:

A. Execute periodic cleaning to keep the work, the site, and adjacent properties free from accumulations of waste materials, rubbish, and windblown debris.

B. Provide onsite containers for the collection of waste materials, debris, and rubbish.

C. Remove waste materials, debris, and rubbish from the site periodically and dispose of at legal areas away from the site.

3.02 DUST CONTROL

The Contractor shall do the following:

A. Clean interior spaces before the start of finish painting and continue cleaning on an as-needed basis until painting is finished.

B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.

3.03 FINAL CLEANING

The Contractor shall do the following:

A. Employ skilled workers for final cleaning.

B. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from interior and exterior surfaces exposed to view.

C. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.

D. Before final completion or Owner occupancy, inspect interior and exterior surfaces exposed to view and all work areas to verify that the entire Work is clean.

END OF SECTION

SECTION 01770
PROJECT CLOSEOUT

PART 1 GENERAL

1.01 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.02 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.03 SUBSTANTIAL COMPLETION

A. When the Contractor considers that the Work or designated portion of the Work is Substantially Complete, the Contractor shall submit written notice to the Engineer with a list of items to be completed or corrected.

B. If the Engineer's inspection finds that the Work is not substantially complete, the Engineer will promptly notify the Contractor in writing, listing observed deficiencies.

C. The Contractor shall remedy deficiencies and send a second written notice of Substantial Completion.

D. When the Engineer finds the Work is Substantially Complete the Engineer will prepare a Certificate of Substantial Completion.

1.04 FINAL COMPLETION

A. When the Contractor considers that the Work or designated period of the Work is complete, the Contractor shall submit written certification to the Engineer indicating the following:

1. The Contract Documents have been reviewed.
2. The Work has been inspected for compliance with the Contract Documents.

3. The Work has been completed in accordance with the Contract Documents and deficiencies listed with Certificates of Substantial Completion have been corrected.
4. The Work is complete and ready for final inspection.
5. All required shop drawings, catalog cuts, maintenance manuals, instruction manuals, test reports, samples, operational manuals, and all other submittals have been submitted and reviewed by the Engineer.
6. All deliverables have been delivered or placed as accepted by the Engineer.

B. If the Engineer's inspection reveals that the Work is incomplete, the Engineer will promptly notify the Contractor in writing listing observed deficiencies.

C. The Contractor shall remedy deficiencies and send a second certification of Final Completion.

D. When the Engineer finds that the Work is complete, the Engineer will consider closeout submittals.

1.05 REINSPECTION FEES

A. If the status of Completion of Work requires more than one re-inspection by the Engineer due to failure of the Work to comply with the Contractor's claims on initial inspection, the Owner will deduct from the final payment to the Contractor the amount of the Engineer's compensation for additional re-inspection services.

1.06 CLOSEOUT SUBMITTALS

A. Evidence of Compliance with Requirements of Governing Authorities:

1. Certificate of Occupancy.
2. All required Certificates of Inspection.

B. Operation and Maintenance Manuals: Under provisions of Section 01830, Operations and Maintenance Manuals.

C. Record Documents: Under provisions of Section 01785, Record Documents.

D. Evidence of Payment and Release of Liens: In accordance with Conditions of the Contract.

E. Consent of Surety to Final Payment.

1.07 STATEMENT OF ADJUSTMENT OF ACCOUNTS

A. Submit final statement reflecting adjustments to total Contract Price, indicating the following:

1. Original total Contract Price.
2. Previous change orders.
3. Changes under allowances.
4. Changes under unit prices.
5. Deductions for uncorrected Work.
6. Penalties and bonuses.
7. Deductions for liquidated damages.
8. Deductions for re-inspection fees.
9. Other adjustments to total Contract Price.
10. Total Contract Price as adjusted.
11. Previous payments.
12. Sum remaining due.

B. The Engineer will issue a final Change Order reflecting approved adjustments to the total Contract Price not previously made by change orders.

1.08 APPLICATION FOR FINAL PAYMENT

A. Submit application for final payment in accordance with provisions of Conditions of the Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01780
WARRANTIES AND BONDS

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall do the following:

A. Compile specified warranties and bonds.
B. Co-execute submittals when so specified.
C. Review submittals to verify compliance with Contract Documents.
D. Submit submittals to the Engineer for review.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Assemble warranties, bonds, and service and maintenance contracts executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Number of original signed copies required: two each.

C. Table of Contents: Neatly typed, in sequence of the Specifications. Provide completion information for each item as follows:

1. Product or work item.

2. Firm, address, telephone and fax numbers, and name and email of principal.

3. Scope.

4. Date of beginning of warranty, bond, or service and maintenance contract.

5. Duration of warranty, bond, or service and maintenance contract.

6. Provide information for Owner's personnel:

a. Proper procedure in case of failure.
b. Instances that might affect the validity of warranty or bond.

7. Contractor, with address, telephone and fax numbers, and the name and email of responsible principal.

D. Submittal of warranties, bonds, and service and maintenance contracts shall be included in submittals for review and before Final Completion with actual dates included.

E. The Contractor's obligation to correct defective or nonconforming Work shall run for 1 year (or such longer period may otherwise be specified in the Contract Documents) beginning from the date Substantial Completion is achieved.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and this Section.

B. All mechanical and electrical equipment together with devices of whatever nature and all components which are furnished and/or installed by the Contractor shall be guaranteed.

C. The guarantee shall be against the manufacturing and/or design inadequacies, materials, and workmanship not in conformity, improper assembly, hidden damage, failure of devices and/or components, excessive leakage, or other circumstances which would cause the equipment to fail under normal design and/or specific operating conditions for 1 year or such longer period as may be shown and/or specified from and after the date of Substantial Completion.

D. The Contractor shall replace and install each piece of equipment, device, or component which shall fail within the term specified above of the guarantee with reasonable promptness without increase in the Contract Price. If the Contractor fails to provide timely repairs as specified in this Section, the Owner shall issue a claim against the Contractor's Bond. In some instances, if approved by the Owner, the Contractor may be allowed to repair the equipment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01785
RECORD DOCUMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section details the minimum requirements for the Contractor for maintenance and recording of Record Documents.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. The Contractor shall store documents and samples in the Contractor's field office apart from documents used for construction and shall do the following:

1. Provide files and racks for storage of documents.
2. Provide cabinet or secure storage space for storage of samples.

B. The Contractor shall institute a computerized record control program.

C. The Contractor shall make documents and samples available at all times for inspection by the Engineer.

D. At Contract closeout, the Contractor shall transmit Record Documents and samples with cover letter to the Engineer, listing the following:

1. Date.
2. Project title and number.
3. Contractor's name and addresses.
4. Number and title of each Record Document.
5. Signature of Contractor or its authorized representative.
6. Contract Section and Subsection numbers.
7. Location.

E. Before assembling and submitting records, the Contractor shall review for completeness the records maintained by its subcontractors.

F. Tracings of all Construction Documents and Shop Drawings made by the Contractor, subcontractors, and suppliers of materials or equipment shall be corrected to show the Work as actually completed or installed.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 PROJECT RECORD

A. The Contractor shall label and file Record Documents and samples in accordance with the corresponding Specification Section number. Each document shall be labeled “PROJECT RECORD” in neat, large, printed letters. Record Documents shall be maintained in a clean, dry, and legible condition. Record documents shall not be used for construction purposes.

3.02 RECORDING

The Contractor shall record construction information as follows:

A. Record and update daily Record information from field notes on a set of opaque drawings and to the satisfaction of the Engineer.

B. Provide felt tip marking pens, maintaining separate colors for each major system, for recording information.

C. Record information concurrently (daily) with construction progress. Work shall not be concealed until required information is recorded.

D. Mark Record Drawings to reflect the following:

1. Measured horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements.
2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
3. Field changes of dimension and detail.

4. Changes made by modifications.
5. Details not on original construction drawings.

E. CAD Requirements for Record Drawings: The Contractor shall provide the Engineer with a complete set of Record Drawings in the version of AutoCAD format specified by the Engineer upon completion of the Work. No additional compensation will be allowed for the Contractor to provide the Record Drawings. The Contractor shall use the AutoCAD drawings furnished by the Engineer for this purpose. Record Drawings must be submitted in the AutoCAD format of the contract drawings. No other CAD software or format will be accepted. It is Contractor's sole responsibility to ensure that the Record Drawings conform to the following CAD requirements:

1. Drawings shall be submitted to the Engineer on CD-ROM. Each CD shall be clearly labeled with the appropriate project number, client name, date, and file names included on each CD. If files are compressed, a description of the compression software must be included along with a copy of the appropriate uncompressing software.
2. All changes to drawings must be done in accordance with the appropriate scale of the drawing revised and shall be delineated by placing a "cloud" around the areas revised and adding a revision triangle indicating the appropriate revision number.
3. Each drawing must have the revision block completed to indicate the revision number, date, and initials of the person revising the drawing. The description of the revision must say "Record Drawing." This procedure must be followed for every drawing even when no changes are made to the drawing.
4. All revisions to drawings must be put on separate layers with the layer names prefixed Record followed by the appropriate existing layer name. The colors and line types of the appropriate existing layers shall be adhered to when creating new layers.
5. The Contractor shall supply one full set of Record Drawings on reproducible black line prints and five full sets of opaque copies.

F. The Contractor shall have the Licensed Land Surveyor certify the Record Drawings as being correct and complete.

END OF SECTION

SECTION 01830
OPERATIONS AND MAINTENANCE MANUALS

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall do the following:

A. Compile product data and related information appropriate for the Owner's maintenance and operation of products furnished under the Contract.

1. Prepare operating and maintenance data as specified in this Section and as referenced in other pertinent Sections of the Specifications. The data presented in the Operations and Maintenance (O&M) Manuals shall be specifically related to this Contract and application.
2. Incorporate maintenance and operation data furnished by the Owner, if any.

B. Furnish all labor, equipment, materials, and all other items to supply and deliver to the Engineer O&M Manuals for the Work in accordance with the requirements of this Section.

C. Provide O&M Manuals for all equipment, including instrumentation, electrical, and process control system equipment and software for the entire Facility.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Manuals which, in general, shall have two levels: a facilities-wide systems level and an individual-component level.

1. The facilities-wide systems level shall do the following:

a. Describe the facilities-wide systems, including diagrams.
b. Explain start-up, shutdown, normal operations, and malfunctions of the facilities-wide systems.
c. Tabulate a lubrication schedule for the facilities-wide systems.
d. Describe preventive maintenance checking procedures for the facilities-wide systems.
e. Include a cross-reference to all individual component manuals.

2. The individual-component level shall contain the following:

    a. Storage requirements.
    b. Installation instructions.
    c. Alignment instructions and tolerances.
    d. Operating instructions.
    e. Troubleshooting instructions.
    f. Lubrication requirements.
    g. Maintenance instructions.
    h. Parts list.
    i. Recommended spare parts list and how to obtain same.

B. Format

1. Size: 8 1/2 x 11 inch (21.59 x 27.94 cm).

2. White paper: 20-lb (9.072 kg) minimum.

3. Text: Manufacturer's printed data or neatly word-processed.

4. Drawings:

    a. Provide reinforced, punched binder tab, bind in with text.
    b. Reduce larger drawings and fold to size of text pages but not larger than 11 x 17 inches (27.94 x 43.18 cm).
    c. Place all drawings at the end of each Section and drawing shall be printed on one side only.

5. Provide a blank page for each separate product or each piece of operation equipment.

    a. Provide a word-processed description of the product and major component parts of equipment.
    b. Provide indexed tabs.

6. Cover: Identify each volume with typed or printed title, "OPERATION AND MAINTENANCE INSTRUCTIONS," listing the following:

    a. Title of Project.
    b. Identity of separate structure as applicable.
    c. Identity of general subject matter covered in the manual.

C. Media

1. Original word-processed CD shall be delivered to the Engineer.
2. All word processing must be done using the latest version of Microsoft Word or as directed by the Engineer.
3. All drawings except control system configuration drawings must be submitted on CD using AutoCAD.

D. Binders

1. Filled to not more than 75% capacity.
2. When multiple binders are used, arrange the data into related consistent groupings.

E. The Contractor shall submit the following:

1. Preliminary O&M Manuals—Five copies of the O&M Instruction Manual for each piece of equipment shall be submitted to the Engineer before delivery of the equipment for review by the Engineer. O&M manuals will not include the manufacturer's test results and Record specifications.
2. Final O&M Manuals—Five copies of the Final Equipment and Systems O&M Manuals, bound and indexed and submitted to the Engineer before the Substantial Completion under this Contract.
3. The cost of these Manuals submitted shall be included in the total Contract Price. Copies supplied under Item 1 will not be included under Item 2.

F. Any modifications required after final O&M submission shall be made to the manuals by issuance of addenda in the form of change pages to the manual. The addenda will identify where the new data are to be inserted, what data are to be removed, and new index sheets as necessary and list of shop drawings and submittals.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to herein shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Administrative Code, 62-555.350, "Operation and Maintenance of Public Water Systems."

B. Florida Administrative Code, 62-600.410, "Operation and Maintenance of Domestic Wastewater Facilities."

1.04 QUALITY ASSURANCE

A. Data shall be prepared by personnel:

1. Trained and experienced in maintaining and operating the described products.
2. Familiar with requirements of this Section.
3. Skilled as a technical writer to the extent required to communicate essential data.
4. Skilled as a draftsman competent to prepare required drawings.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 CONTENTS, EACH VOLUME

A. Neatly word-processed table of contents for each volume, arranged in systematic order, to include the following:

1. Contractor, name of responsible principal, address, fax number, and telephone number.

2. A list of each product required to be included, indexed to content of the volume.

3. A list with each product, name, address, fax number, and telephone number of the following:

a. Subcontractor or installer.
b. A list of each product to be included, indexed to content of the volume.
c. Identify area of responsibility of each subcontractor or installer, if more than one.
d. Local source of supply for parts and replacement.
e. Manufacturer.

4. Identify each product by product name and other identifying symbols as set forth in the Contract Documents.

B. Product Data

1. Include only those sheets that are pertinent to the specific product.

2. Annotate each sheet to achieve the following:

a. Clearly identify the specific product or part installed.
b. Clearly identify data applicable information.
c. Delete references to inapplicable information.

C. Drawings

1. Supplement product data with drawings as necessary to illustrate the following clearly:

a. Relations of component parts of equipment and systems.
b. Control and flow diagrams.
c. Owner Tag Numbers.

2. Coordinate drawings with information in Record Documents to ensure correct illustration of completed installation.

3. Do not use Record Documents as maintenance drawings.

D. Written text as required to supplement product data for the particular installation:

1. Organize in consistent format under separate headings for different procedures.
2. Provide a logical sequence of instructions for each procedure.
3. Describe how the complete system is to operate.

E. Copy of pertinent information related to warranty, bond, and service Contract issued.

1. Provide information sheet for Owner's personnel with the following information:

a. Proper procedures in event of failure.
b. Instances that might affect the validity of warranties or bonds.

F. Training manuals used in training courses will become part of this Manual.

1.08 MANUAL FOR MATERIALS AND FINISHES

A. Content, for applied materials and finishes:

1. Manufacturer's data, giving full information on products:

a. Catalog number, size, composition.
b. Color and texture designations.
c. Information required for re-ordering special-manufactured products.

2. Instructions for care and maintenance:

a. Manufacturer's recommendation for types of cleaning agents and methods.
b. Cautions against cleaning agents and methods that are detrimental to product.
c. Recommended schedule for cleaning and maintenance.

B. Content, for moisture-protected and weather-exposed products:

1. Manufacturer's data, giving full information on products:

a. Applicable standards.
b. Chemical composition.
c. Details of installation.

2. Instructions for inspection, maintenance, and repair.

C. Additional requirements for maintenance data as required by other Sections of the Specifications.

1.09 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Content, for each electrical, mechanical, instrumentation, and communication system, as appropriate:

1. A table identifying each piece of equipment, each associated control or instrument, the location of the control or instrument, and the function of the control or instrument.

2. A description of the system and its component parts:

    a. Function, normal operating characteristics, and limiting conditions for the system, the sub-system, and the component parts.
    b. Performance curves, engineering data, and tests.
    c. Complete nomenclature and commercial numbers of replaceable parts.

3. Circuit directories of panel board:

    a. Electrical service.
    b. Controls.
    c. Communications.

4. As-installed color-coded wiring diagrams.

5. Instrument loop diagrams showing the path that a control or instrumentation signal takes from its origin to the action it takes.

    a. An electrical schematic for each item.
    b. A chart listing the controls/instruments in a loop identifying the equipment's abbreviated symbol, a description of the symbol, design criteria, process flow, quantity supplied, and manufacturer's model and serial number.

6. Operating procedures:

    a. Routine and normal operating instructions.
    b. Sequences required.
    c. Special operating instructions.

7. Maintenance procedures:

    a. Routine operations.
    b. Guide to "trouble-shooting."
    c. Disassembly, repair, and re-assembly.
    d. Alignment, adjustment, and checking.

8. The manufacturer's printed operating and maintenance instructions.

9. A list of the original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

10. Other data as required under other Sections of the Specifications.

11. Abnormal and emergency operations:

    a. Potential overloads.
    b. Procedures for equipment breakdown.
    c. Action to be taken in a power outage.
    d. Identity of alarms by equipment location and action to correct.
    e. Equipment safety features, requirements, and potential hazards.

12. Programming manuals for programmable devices including list of standard programming.

B. Content, for each unit of equipment and system, as appropriate:

1. Description of unit and component parts:

    a. Function, normal operating characteristics, and limiting conditions.
    b. Performance curves, engineering data, and tests.
    c. Complete nomenclature and commercial number of replaceable parts.
    d. Model number and name plate data for each piece of equipment.
    e. Assembly drawings.
    f. List of all special tools required to service equipment and/or systems including where the tools are stored.

2. Operating procedures:

    a. Start-up, break-in, routine, and normal operating instructions.
    b. Regulation, control, stopping, shut-down, and emergency instructions.
    c. Summer and winter operating instructions.
    d. Special operating instructions.
    e. Control settings and ranges.

3. Maintenance procedures:

    a. Type and frequency of preventive maintenance activities required for each piece of equipment.
    b. Guide to "trouble-shooting."
    c. Disassembly, repair, and re-assembly.
    d. Alignment, adjusting, and checking.

4. Servicing and lubrication schedule:

    a. List of lubricants required.
    b. Period between lubrications.

5. Manufacturer's printed operating and maintenance instructions. (This is not to be a generalized catalog of the entire product line.)

6. Description of sequence of operation.

7. The original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance:

    a. Predicted life of parts subject to wear.
    b. Items recommended to be stocked as spare parts.

8. As-installed control diagrams.

9. Each Contractor's coordination drawings.

10. List of the original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

11. Other data as required under pertinent Sections of the Specifications.

12. Charts of equipment, instrument, and valve tag numbers with location and function:

    a. Reference drawing which shows equipment, instrument, or valve location.
    b. Manufacturer's model and serial number.
    c. Valve actuator type (manual, hydraulic, electric, or pneumatic).

13. Local services (process water and air, drains, HVAC, natural gas and steam).

C. The Contractor shall prepare and include additional data when the need for such data becomes apparent during instruction of the Owner's personnel.

D. Additional requirements for O&M data required by other Sections of the Specifications.

PART 2 PRODUCTS

2.01 O&M MANUALS

A. Binders: The manuals shall be supplied in binders that are the same as those provided in Paragraph 1.03.D above.

B. Electronic Version: Word-processed portions of the manuals shall also be provided on CDs. The electronic version manuals must be capable of being read, edited, and printed with Microsoft Word or Owner-approved file format at the time of the transmittal of documents. The format will be provided to the Contractor upon request. All drawings shall be generated using personal computer and plotter with the software package program from AutoCAD.

PART 3 EXECUTION (NOT USED)

END OF SECTION

DIVISION 2

SITE CONSTRUCTION

SECTION 02000
REFERENCED FDOT SPECIFICATIONS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to provide for the construction where indicated on the Drawings.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product data for reinforced concrete pipe, along with gaskets, is required to indicate performance in accordance with the specifications.

B. Shop drawings for drainage structures including curb inlets, ditch bottom inlets, manholes, and mitered end sections is required to indicate performance in accordance with the specifications. Include shop drawings for frames, covers, and grates with each drainage structure.

C. Submit maintenance of traffic plan(s) for each phase of construction.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Specification Section shall be the latest revision of any such document in effect at the bid time, unless otherwise noted. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section. The referenced FDOT Standard Specifications that apply to this project include the following sections along with the sections referenced within these sections:

- 102 Maintenance of Traffic

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this Contract.

2. Payment for this project is in accordance with the Bid Form.
3. Additional requirements superseding the applicable portions of the above FDOT Standard Specifications are provided in the subsequent sections of these Technical Specifications.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Specification Section 01780, Warranties and Bonds.

PART 2 PRODUCTS

2.01 GENERAL

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section. The referenced FDOT Standard Specifications that apply to this project include the following sections along with the sections referenced within these sections:

- 102 Maintenance of Traffic

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this contract.
2. Payment for this project is in accordance with the Bid Form.
3. Additional requirements superseding the applicable portions of the above FDOT Standard Specifications are provided in the subsequent sections of these Technical Specifications.

PART 3 EXECUTION

3.01 GENERAL

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section. The referenced FDOT

Standard Specifications that apply to this project include the following sections along with the sections referenced within these sections:

- 102 Maintenance of Traffic

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this contract.
2. Payment for this project is in accordance with the Bid Form.
3. Additional requirements superseding the applicable portions of the above FDOT Standard Specifications are provided in the subsequent sections of these Technical Specifications.

END OF SECTION

SECTION 02230
SITE PREPARATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, and equipment required and perform all site preparation, complete as shown on the Drawings and as specified in this Section.

B. The Contractor shall obtain all permits required for site preparation before proceeding with the work, including clearing and tree removal.

C. The areas to be cleared, grubbed, and stripped within public rights-of-way and utility easements shall be minimized to the extent possible for the scope of pipeline work and in consideration of the actual means and methods of construction used. No unnecessary site preparation shall be performed within these areas.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. Submit to the Engineer copies of all permits required before clearing, grubbing, and stripping work.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 CLEARING

A. The Contractor shall cut and remove all timber, trees, stumps, brush, shrubs, roots, grass, weeds, rubbish, and any other objectionable material resting on or protruding through the surface of the ground.

B. The Contractor shall preserve and protect trees and other vegetation designated on the Drawings or directed by the Engineer to remain as specified below.

3.02 GRUBBING

A. The Contractor shall grub and remove all stumps, roots in excess of 1-1/2 inches in diameter, matted roots, brush, timber, logs, concrete rubble, and other debris encountered to a depth of 18 inches below original grade or 18 inches beneath the bottom of foundations, whichever is deeper.

B. The Contractor shall refill all grubbing holes and depressions excavated below the original ground surface with suitable materials and compact to a density conforming to the surrounding ground surface in accordance with Section 02305, Earthwork for Utilities.

3.03 STRIPPING

A. The Contractor shall strip topsoil from all areas to be occupied by buildings, structures, and roadways and all areas to be excavated or filled.

B. Topsoil shall be free from brush, trash, large stones, and other extraneous material. Avoid mixing topsoil with subsoil.

C. The Contractor shall stockpile and protect topsoil until it is used in landscaping, loaming, and seeding operations and dispose of surplus topsoil after all work is completed.

3.04 DISPOSAL

A. Dispose of material and debris from site preparation operations by hauling such materials and debris to an approved off-site disposal area. No rubbish or debris of any kind shall be buried on the site.

B. Burning of cleared and grubbed materials or other fires for any reason will not be permitted.

3.05 PROTECTION

A. Trees and other vegetation designated on the Drawings or directed by the Engineer to remain shall be protected from damage by all construction operations by erecting suitable barriers, guards and enclosures, or by other approved means. The Contractor shall conduct clearing operations in a manner to prevent falling trees from damaging trees and vegetation designated to remain and to the work being constructed. The Contractor shall provide for the safety of employees and others.

B. The Contractor shall maintain protection until all work in the vicinity of the work being protected has been completed.

C. The Contractor shall not operate heavy equipment or stockpile materials within the branch spread of existing trees.

D. The Contractor shall immediately repair any damage to existing tree crowns, trunks, or root systems. Roots exposed and/or damaged during the work shall immediately be cut off cleanly inside the exposed or damaged area. Treat cut surfaces with an acceptable tree wound paint and topsoil spread over the exposed root area.

E. When work is completed the Contractor shall remove all dead and downed trees. Live trees shall be trimmed of all dead and diseased limbs and branches. All cuts shall be cleanly made at their juncture with the trunk or preceding branch without injury to the trunk or remaining branches. Cuts over 1 inch in diameter shall be treated with an acceptable tree wound paint.

F. The Contractor shall restrict construction activities to those areas within the limits of construction designated on the Drawings, within public rights-of-way, and within easements provided by the Owner. Adjacent properties and improvements on these properties, public or private, which become damaged by construction operations shall be promptly restored to their original condition to the full satisfaction of the property owner.

G. The Contractor shall remove trees damaged beyond saving, through no fault of the Contractor, as directed by the Engineer.

END OF SECTION

SECTION 02240
DEWATERING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to complete the dewatering activities. All work in this Section shall be done in accordance with the requirements of the Environmental Resource Permit and Water Use Permit (if required) as issued by the Southwest Florida Water Management District (SWFWMD).

B. In addition to the requirements listed in this Section, the Contractor shall obtain, if required, and comply with all requirements of the Generic Permit for the Discharge of Ground Water From Any Non-Contaminated Site Activity as described in FAC 62-621-300.

C. Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control groundwater flow into excavations and permit construction to proceed on dry, stable subgrades.

1. Maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
2. Prevent surface water from entering excavations by grading, dikes, or other means.
3. Remove dewatering system if no longer needed.

D. The Contractor shall dewater so as to prevent damage to existing work. The Contractor shall repair or replace damage resulting from the dewatering activities promptly, remedy environmental damage as approved by the Engineer, and pay any and all fines levied to the Contractor at no additional cost or time to the Owner.

E. The Dewatering Plan shall be signed and sealed by the licensed professional engineer responsible for its preparation.

F. The Contractor shall design the dewatering system. The Contractor shall be responsible for obtaining whatever investigations are necessary, before bidding, to design the dewatering system.

1.02 SUBMITTALS

The Contractor shall submit the following in accordance with Section 01330, Submittals and Acceptance:

A. Before construction, the Contractor shall obtain a dewatering permit from the SWFWMD as required. At a minimum, the dewatering plan submitted with the dewatering application shall include the following:

1. Duration of dewatering for each area.
2. Number and size of pumps.
3. Method of dewatering each area.
4. Methods for routing/containing the discharge.
5. Methods of isolating dewatering areas.
6. Time dewatering structure will be in place.
7. Proposed discharge points.

Five copies of the plan shall be submitted to the Engineer for record purposes only.

B. The Contractor shall be responsible for determining if a Water Use Permit will be required. If a Water Use Permit is required, it is the Contractor's responsibility to obtain the required information from the Engineer and Owner to complete the Water Use Permit application to submit with the Dewatering Plan. If a Water Use Permit is required, the Contractor shall submit five copies of the application to the Owner/Engineer for submittal purposes only.

C. The Contractor shall be responsible for obtaining a Generic Permit for the Discharge of Produced Ground Water from any Non-Contaminated Site Activity as set forth in FDEP Rule 62-621.300(2), FAC. The Contractor shall obtain the required permit form 62-621.300(2) and the required information from the Engineer and Owner to complete the Generic Permit for the Discharge of Produced Ground Water from any Non-Contaminated Site Activity application to submit with the Dewatering Plan. The Contractor shall submit five copies of the application to the Owner/Engineer for submittal purposes only.

D. Provide photographs or videotape, sufficiently detailed, of existing conditions of adjoining properties, facilities, and other construction and site improvements that might be later misconstrued as damage caused by dewatering operations.

E. Submit Record Drawings at Project closeout identifying and locating utilities and other subsurface structural, electrical, or mechanical items encountered during dewatering.

1. Note locations and capping depth of wells and well points.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Administrative Code (FAC)

1. FAC 62-621-300—FDEP – Generic Permits.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with water disposal requirements of authorities having jurisdiction.

B. Pre-installation Conference: Conduct conference at the Project site to present and discuss dewatering means, methods, and monitoring program.

C. Identify a person who shall be present at all times during the execution of this portion of the Work and who shall be thoroughly familiar with the dewatering system being installed for this Project, the referenced standards, environmental and permit requirements, the requirements of this Work, and who shall direct all work performed under this Section.

D. It shall be the responsibility of the Contractor to determine the water levels before and during the dewatering work.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 QUALIFICATIONS

A. The Contractor shall provide at least one person who shall be present at all times during the execution of this portion of the Work and who shall be thoroughly familiar with the dewatering system being installed, the referenced standards, the requirements of this Work, and who shall direct all work performed under this Section.

B. The Contractor shall be responsible for determining the water level before beginning excavation and construction.

1.08 PRE-BID INSPECTION AND TESTING

A. The Contractor is advised that site soil borings may indicate groundwater levels below the levels which may occur in response to normal, seasonal, extreme, or prolonged rainfall. The Contractor is further advised that site soil borings may not necessarily represent soil conditions to be encountered elsewhere on the job site, other than at the specific boring locations.

B. Before bidding, the Contractor shall perform a detailed site inspection and, if desired, obtain the Owner's permission to perform site-specific testing as he deems necessary to obtain all required information relative to project dewatering requirements.

C. The Contractor shall include as part of his Bid the total cost of all surface and subsurface dewatering as required to construct the Project in complete compliance with the Drawings and these Specifications.

1.09 PROJECT CONDITIONS

A. The Contractor shall not interrupt utilities serving facilities occupied by the Owner or others unless approved by the Owner and Engineer and then only after arranging to provide temporary utility services according to requirements indicated.

B. A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of the geotechnical engineer and represent interpretations of subsoil conditions, tests,

and results of analyses conducted by the geotechnical engineer. The Owner will not be responsible for interpretations or conclusions drawn from these data.

1. The Geotechnical Report is included in an Appendix of these specifications.
2. Make additional test borings and conduct other exploratory operations necessary for dewatering.

C. Survey adjacent structures and improvements, employing a professional land surveyor licensed in Florida to establish exact elevations at fixed points to monitor settlement. Clearly identify monitoring points and reference vertical datum, and benchmarks. Monitor and record existing initial elevations.

1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify the Engineer if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction and existing structures.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 DEWATERING SYSTEM

A. The dewatering system shall be adequate to drain the soils to be excavated to the extent that the piezometric water level in the construction area is a minimum of 2 feet below the bottom of the excavation, side slopes of excavations, or bottom of the footings at all times, or as otherwise required to obtain the specified compaction and installation conditions. Pipeline trenches must be dewatered at least 1 foot below the trench bottom.

B. If layered soils are encountered, the hydrostatic head in the zone below the subgrade elevation shall be relieved to prevent uplift.

C. Unless otherwise noted and before any excavating below or within 2 feet above the groundwater level, a dewatering system shall be placed into operation to lower water levels to the extent specified previously and then shall be operated continuously 24 hours a day, 7 days a week, throughout the excavation to maintain and protect all work until the work has been completed to the satisfaction of the Engineer.

D. Where used, well points shall be installed in an Engineer-approved manner and in sufficient numbers to provide the necessary removal of water as stated previously.

Well points and header piping shall be installed so that traffic on public thoroughfares and site access roads will not be impeded.

E. The Contractor shall be solely responsible for the arrangement, location, and depths of the dewatering system necessary to accomplish the specified work. The dewatering system shall stay in full operation until not less than 90% of the total load is applied, as will be determined by the Engineer, or until excavations and trenches have been backfilled and compacted.

F. To prevent excessive noise, exhaust from all pumps and engines shall be silenced and muffled.

G. Wellpoint or surface water pump discharge shall be controlled to prevent erosion, undermining, and all other damage and be piped to approved locations.

H. With the Engineer's assistance, the Contractor is responsible for determining what approvals and permits are required to comply with any and all applicable regulations and permitting requirements relating to dewatering activities. With the Engineer's assistance the Contractor shall obtain all necessary approvals and permits and comply with any and all applicable regulations and permitting requirements concerning all dewatering activities, including pumpage and discharge. The Contractor is solely responsible for all costs associated with the proper implementation of dewatering activities.

I. The Contractor shall perform all dewatering work in strict compliance with Section 01350, Environmental Protection Procedures, and the Contract Drawings.

J. Excavations shall be kept free from water during the placing of concrete and for 36 hours after or until concrete forms are removed.

K. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.

1. Prevent surface water and subsurface or groundwater from entering excavations, ponding on prepared subgrades, or flooding the site and surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

L. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from the Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

M. Install sufficient dewatering equipment to drain water-bearing strata above and below the bottom of foundations. If excavating through layered soils, relieve any potential groundwater hydrostatic head in the zones below to prevent uplift.

1. Open-sump pumping which leads to loss of fines, subgrade softening, and slope instability shall not be permitted.

N. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water in a manner that avoids flooding or accumulation on private property. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

3.02 OBSERVATION WELLS

A. The Contractor shall install observation wells as may be required to record accurate water levels.

B. The Contractor shall be responsible for maintaining all observation wells and observing and recording the elevation of the piezometric water levels daily.

C. Wells damaged or destroyed shall be replaced at no additional cost to the Owner.

3.03 CLEANUP

A. Upon completing dewatering elsewhere on the Project, the Contractor shall remove all equipment and leave the project site in a neat, clean, and acceptable condition satisfactory to the Owner. Wellpoint holes and excavations shall be adequately backfilled and compacted to prevent settlement.

END OF SECTION

SECTION 02300
EARTHWORK FOR STRUCTURES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, equipment, tools, appliances, and materials and perform all operations necessary for the following:

1. Preparing subgrades for slab-on-grade, walks, pavements, and lawns and grasses.
2. Excavating and backfilling for buildings and structures.
3. Laying the subbase course for concrete sidewalks and pavements.
4. Excavating and backfilling for utility trenches.
5. Excavating and backfilling for trenches for buried mechanical and electrical utilities and pits for buried utility structures, as indicated on the Contract Drawings and described in this Section.

1.02 SUBMITTALS

The Contractor shall submit the following shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D2487 of each onsite and borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D1557 for each onsite and borrow soil material proposed for fill and backfill.

B. The Contractor shall submit records before the start of this work. The Contractor shall verify that the existing conditions are correct as shown on the plans and mentioned in these Specifications. The Contractor shall note any discrepancies found immediately and notify the Owner and Engineer. The records shall include the following:

1. The location of all underground utilities, structures, etc. surrounding the areas to be excavated that may be impacted by the work.
2. The location of test excavations.
3. The location of inspections.

C. Testing Agency Invoices indicating if the invoice is for an initial test or a re-test of the Contractor's work.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM C33/C33M—Standard Specification for Concrete Aggregates.
2. ASTM D698—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).
3. ASTM D1556/D1556M—Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
4. ASTM D1557—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).
5. ASTM D2167—Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
6. ASTM D2487—Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
7. ASTM D2937—Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
8. ASTM D2940/D2940M—Standard Specification for Graded Aggregate Material For Bases or Subbases for Highways or Airports.
9. ASTM D3740—Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
10. ASTM D6938—Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
11. ASTM E329—Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

B. Occupational Safety and Health Administration (OSHA)

1. OSHA 2226—Trenching and Excavation Safety.

1.04 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E329 to conduct soil materials and definition testing, as documented according to ASTM D3740.

B. The Contractor shall do the following:

1. Ensure that excavations provide adequate working space and clearance for the work to be performed and for installing piping and buried utilities. In no case shall excavation faces be undercut.
2. Ensure that foundation surfaces are clean and free of loose material of any kind when pipelines and buried utilities are placed on them.
3. Excavate, trench, and backfill in compliance with applicable requirements of governing authorities having jurisdiction.
4. Ensure that shoring and sheeting for excavations are designed by a Florida-registered Professional Engineer and are in accordance with OSHA 2226.
5. Before beginning any excavation or grading, ensure the accuracy of all survey data indicated on the Contract Drawings and in the Specifications and/or as provided. If the Contractor discovers any inaccuracies, errors, or omissions in the survey data, the Contractor shall immediately notify the Owner so that proper adjustments can be anticipated or ordered. If the Contractor begins any excavation or grading, this shall be considered an acceptance of the survey data by the Contractor, after which time the Contractor has no claim against the Owner resulting from alleged errors, omissions, or inaccuracies of the survey data.
6. Ensure that tolerances for excavation are plus or minus 0.10 foot to the required line and to the required grade. Tolerance for compaction of in-place material shall be plus or minus 0.10 foot to the required grade, unless otherwise noted.
7. Remove unsatisfactory materials and unsuitable materials including muck, silts, peat, and other loose and very loose compressible soils from excavations before placing pipe foundation, bedding, and buried utilities.

1.05 PROJECT CONDITIONS

A. Existing Utilities: The Contractor shall not interrupt utilities serving facilities occupied by the Owner or others unless permitted to do so in writing by the Engineer and then only after arranging to provide temporary utility services according to requirements indicated.

1. Notify the Engineer not less than 2 days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without the Engineer's written permission.
3. Contact a utility-locator service and obtain utility locations for the Project area before excavating.

B. The Contractor shall demolish and completely remove from the site underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

1.06 DEFINITIONS

A. *Backfill*: Soil material or controlled low-strength material used to fill an excavation.

1. *Initial Backfill*: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. *Final Backfill*: Backfill placed over initial backfill to fill a trench.

B. *Base Course*: The course placed between the subbase course and hot-mix asphalt paving.

C. *Bedding Course*: The course placed over the excavated subgrade in a trench before laying pipe.

D. *Borrow Soil*: Suitable soil imported from off site for use as fill or backfill.

E. *Drainage Course*: The course supporting the slab-on-grade that also minimizes the upward capillary flow of pore water.

F. *Excavation*: Removing material encountered above subgrade elevations and to lines and dimensions indicated.

1. *Authorized Additional Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
2. *Unauthorized Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Engineer. Unauthorized excavation as well as remedial work directed by the Engineer shall be without additional compensation.

G. *Fill*: Soil materials used to raise existing grades.

H. *Structures*: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. *Subgrade*: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

J. *Utilities*: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

A. General: The Contractor shall provide borrow soil materials when sufficient suitable soil materials are not available from excavations.

B. Suitable Soils: ASTM D2487 Soil Classification Groups SW and SP or a combination of these groups, free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsuitable Soils: Soil Classification Groups GW, GP, GM, GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or a combination of these groups.

1. Unsuitable soils also include satisfactory soils not maintained within 2% of optimum moisture content at time of compaction.

D. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95% passing a 1-1/2-inch sieve and not more than 8% passing a No. 200 sieve.

E. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90% passing a 1-1/2-inch sieve and not more than 12% passing a No. 200 sieve.

F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; except with 100% passing a 1-inch sieve and not more than 8% passing a No. 200 sieve.

G. Sand: ASTM C33/C33M; fine aggregate, natural, or manufactured sand.

H. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

PART 3 EXECUTION

3.01 PREPARATION

A. The Contractor shall protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. The Contractor shall prepare subgrade for earthwork operations including removing vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface as specified in Section 02230, Site Preparation.

C. The Contractor shall protect and maintain erosion and sedimentation controls, which are specified in Section 01350, Environmental Protection Procedures.

3.02 DEWATERING

A. The Contractor shall prevent surface water and groundwater from entering excavations, from ponding on prepared subgrades, and from flooding the Project site and surrounding area.

B. The Contractor shall protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
2. Install a dewatering system**,** specified in Section 02240, Dewatering, to keep subgrades dry and convey groundwater away from excavations. Maintain until dewatering is no longer required.

3.03 EXPLOSIVES

A. Explosives: Do not use explosives.

3.04 EXCAVATION, GENERAL

A. Unclassified Excavation: The Contractor shall excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered.

Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsuitable soil materials, replace with suitable soil materials.

3.05 EXCAVATION FOR STRUCTURES

A. The Contractor shall excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.10 foot. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb the bottom of the excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 0.10 foot. Do not disturb the bottom of excavations intended as bearing surfaces.

3.06 EXCAVATION FOR WALKS AND PAVEMENTS

A. The Contractor shall excavate surfaces under walks and pavements to indicated lines, cross-sections, elevations, and subgrades.

3.07 SUBGRADE INSPECTION

A. The Contractor shall notify the Engineer when excavations have reached the required subgrade.

B. If the Engineer determines that unsuitable soil is present, the Contractor shall continue excavation and replace with compacted backfill or fill material as directed.

C. The Contractor shall proof-roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll the subgrade in one direction**,** repeating proof-rolling in the direction perpendicular to the first direction. Limit vehicle speed to 3 miles per hour (mph).

2. Excavate soft spots, unsuitable soils, and areas of excessive pumping or rutting, as determined by the Engineer, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices or additional work.

E. As directed by the Engineer, the Contractor shall reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities without additional compensation.

3.08 UNAUTHORIZED EXCAVATION

A. The Contractor shall fill unauthorized excavation under foundations or wall footings by extending the bottom elevation of concrete foundation or footing to the excavation bottom without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2,500 psi, may be used when approved by the Engineer.

1. Fill unauthorized excavations under other construction or utility pipe as directed by the Engineer.

3.09 STORAGE OF SOIL MATERIALS

A. The Contractor shall stockpile excavated suitable soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water.

1. Stockpile soil materials away from edge of excavations. Do not store within the drip line of remaining trees.

3.10 BACKFILL

A. Backfill and compaction shall be according to the recommendations of the Geotechnical Report included as an Appendix to these Specifications.

B. The Contractor shall place and compact backfill in excavations promptly, but not before completing the following:

1. Constructing below finish grade, including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.

6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

C. The Contractor shall place backfill on subgrades free of mud.

3.11 SOIL FILL

A. The Contractor shall plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. The Contractor shall place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use suitable soil material.
2. Under walks and pavements, use suitable soil material.
3. Under building slabs, use engineered fill.
4. Under footings and foundations, use engineered fill.

C. The Contractor shall place soil fill on subgrades free of mud.

3.12 SOIL MOISTURE CONTROL

A. The Contractor shall uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compacting to within 2% of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy.
2. Remove and replace or scarify and air dry otherwise suitable soil material that exceeds optimum moisture content by 2% and is too wet to compact to the specified dry unit weight.

3.13 COMPACTION OF SOIL BACKFILLS AND FILLS

A. The Contractor shall place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. The Contractor shall place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. The Contractor shall compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D698:

1. Under structures, building slabs, steps, and pavements, scarify and recompact the top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95%.
2. Under walkways, scarify and recompact the top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92%.
3. Under lawn or unpaved areas, scarify and recompact the top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90%.
4. For utility trenches, compact each layer of initial and final backfill soil material at 85% in unpaved lawn areas. Final backfill compaction shall meet the requirement listed above depending on the location of the trench.

3.14 GRADING

A. General: The Contractor shall uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross-sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.15 FIELD QUALITY CONTROL

A. The number and location of the tests shall be as specified in these Specifications and as directed by the Engineer during construction.

B. The Contractor shall coordinate activity with the Engineer and the testing agency to permit testing as directed in the presence of the Engineer.

C. The cost of all testing to achieve specified requirements shall be borne by the Contractor. The Contractor shall be reimbursed by the Owner for passing field tests based on the Testing Allowance pay item listed in the Contract Documents.

D. The costs of any and all retests due to failure to achieve specified requirements shall be solely borne by the Contractor and are not reimbursable under this Contract.

E. All materials proposed for use shall be tested as follows:

Material	Required Test	Min No. Tests
Suitable Soil Materials	Soil Classification using ASTM D2487 (including all tests contained therein)	One per source of materials to determine conformance with materials specified herein; additional test whenever there is any apparent change.
	Soil moisture-density relationship using Modified Proctor ASTM D1557	One per source of material or apparent change in material.

F. The Contractor shall allow the testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after the test results for previously completed work comply with requirements.

G. Footing Subgrade: At footing subgrades, the testing agency will perform at least one test of each soil stratum to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Engineer.

H. The testing agency will test compaction of soils in place according to ASTM D1556/D1556M, ASTM D2167, ASTM D2937, and ASTM D6938 as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2,000 square feet or less of paved area or building slab, but in no case fewer than three tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for each 100 feet or less of wall length but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 400 feet or less of trench length but no fewer than two tests.

I. When the testing agency reports that subgrades, fills, or backfills have not achieved the degree of compaction specified, the Contractor shall scarify and moisten or aerate or remove and replace soil to the depth required and recompact and retest until specified compaction is obtained.

J. The approved testing agency shall transmit copies of field testing results as follows:

1. One copy to the Owner.
2. Two copies to the Engineer.
3. Two copies to the Contractor.

The field test reports shall include, at a minimum, project title; project location; location of sample(s) tested; time of testing; date of testing; testing person's full name; testing agency name, address, and telephone number; and test results.

K. No soil material shall be used until (1) the Engineer has reviewed and approved test reports and (2) the Contractor submits certification that the soil material proposed for construction is clean and meets gradation and other parameters specified in this Specification.

L. At no cost to the Owner, the Contractor shall remove and replace or correct all materials and work which tests indicate do not conform, in the opinion of the Engineer, to the requirements of these Specifications.

M. The results of in-place density tests shall be considered satisfactory if the density in each instance is equal to or greater than the specified density. Soil moisture content at the time of testing shall conform to requirements of these Specifications.

N. Where unsatisfactory compaction is revealed by the tests, the Contractor shall re-excavate, backfill, recompact, and/or rework the backfill as required to obtain the required degree of compaction over the entire depth of the excavation.

O. The testing agency shall transmit to the Engineer copies of all testing agency invoices submitted to the Contractor for payment. Invoices shall clearly indicate specific services and date and time services are rendered and shall indicate if the invoiced testing cost is an initial test of the Contractor's work or is a re-test required due to the Contractor's failure to initially achieve the specified requirements.

3.16 PROTECTION

A. Protecting Graded Areas: The Contractor shall protect newly graded areas from traffic and erosion and keep them free of trash and debris.

B. The Contractor shall repair and reestablish grades to the specified tolerances where completed or partially completed surfaces become eroded, rutted, settled,

or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by the Engineer and reshape and recompact.

C. Where settling occurs before the Project Correction Period elapses, The Contractor shall remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: The Contractor shall transport surplus suitable soil to designated storage areas on the Owner's property and stockpile and spread this soil as directed by the Engineer.

1. Remove waste material, including unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.

END OF SECTION

SECTION 02305
EARTHWORK FOR UTILITIES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall provide all materials, equipment, labor, and work necessary to completely construct the project in accordance with the Contract Documents. This work includes but is not limited to the following:

1. Backfilling trenches at the end of each working day or placement of steel plates over trenches after working hours. Steel plates shall be H-20 load rated.
2. Preparing trench foundations.
3. Providing suitable material for all trenches as specified and as required.
4. Obtaining, storing, maintaining, and disposing of materials.
5. Dewatering, shoring, and sheeting.
6. Placing, compacting, testing, final grading, and subgrade demolition.
7. Performing all other work required by the Contract Documents.

B. The Contractor is responsible for performing all work so as not to damage existing roadways, facilities, utilities, structures, etc. and shall repair and replace such damage to equal or better than its original undamaged condition without cost to the Owner.

C. The Contractor shall examine the site before submitting a bid, taking into consideration all conditions that may affect the work.

D. The Contractor shall coordinate all additional subsurface investigations and testing included with this work with the Engineer before performing the excavation and foundation preparation work. In general, if the Contractor finds different and unsuitable/unsatisfactory soil conditions during the work, the Contractor shall notify the Engineer and the Owner immediately.

1.02 SUBMITTALS

The Contractor shall submit the following shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D2487 of each onsite and borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D1557 for each onsite and borrow soil material proposed for fill and backfill.

B. The Contractor shall submit records before the start of this work. The Contractor shall verify that the existing conditions are correct as shown on the plans and mentioned in these Specifications. The Contractor shall note any discrepancies found immediately and notify the Owner and Engineer. The records shall include the following:

1. Location of all existing underground utilities, structures, etc. surrounding the areas to be excavated that may be impacted by the work.
2. Location of test excavations.
3. Location of inspections.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply:

A. American Society for Testing and Materials (ASTM)

1. ASTM D1556/D1556M—Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
2. ASTM D1557—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
3. ASTM D2487—Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
4. ASTM D2937—Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
5. ASTM D3282—Standard Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.

6. ASTM D3740—Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used In Engineering Design and Construction.
7. ASTM D6938—Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
8. ASTM E329—Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

B. Florida Statutes (FL)

1. Florida Trench Safety Act (90-96, Laws of Florida).

C. Occupational Safety and Health Administration (OSHA)

1. 29 CFR 1926, Subpart P—Safety and Health Regulations for Construction, Excavations.
2. OSHA 2226—Trenching and Excavation Safety.

1.04 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E329 to conduct soil materials and definition testing, as documented according to ASTM D3740.

B. The Contractor shall do the following:

1. Ensure that excavations provide adequate working space and clearance for the work to be performed and for installing piping and buried utilities. In no case shall excavation faces be undercut.
2. Ensure that foundation surfaces are clean and free of loose material of any kind when pipelines and buried utilities are placed on them.
3. Perform excavating, trenching, and backfilling in compliance with applicable requirements of governing authorities having jurisdiction.
4. Ensure that shoring and sheeting for excavations are designed by a Florida-registered Professional Engineer and are in accordance with the OSHA 2226.
5. Before beginning any excavation or grading, ensure the accuracy of all survey data indicated on the Contract Drawings and in these Specifications and/or as provided. If the Contractor discovers any inaccuracies, errors, or omissions in the survey data, the Contractor shall immediately notify the Owner so that proper adjustments can be anticipated or ordered. If the Contractor begins any excavation or grading, this shall be considered an acceptance of the survey data by the Contractor, after which time the

Contractor has no claim against the Owner resulting from alleged errors, omissions, or inaccuracies of the survey data.

6. Ensure that tolerances for excavation are ±0.10 foot to the required line and to the required grade. Tolerance for compaction of in-place material shall be ±0.10 foot to the required grade.
7. Ensure that all trench materials derived from the project site and imported to this site are examined, tested, and classified by an Engineer-approved soils testing laboratory.
8. Remove unsuitable materials and unsuitable materials including muck, silts, peat, and other loose and very loose compressible soils from excavations before placing pipe foundation, bedding, and buried utilities.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 PROJECT CONDITIONS

A. Existing Utilities: The Contractor shall not interrupt utilities serving facilities occupied by the Owner or others unless permitted to do so in writing by the Engineer and then only after arranging to provide temporary utility services according to the requirements indicated.

1. Notify the Engineer not less than 2 days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without the Engineer's written permission.
3. Contact a utility-locator service and obtain utility locations for the Project Area before excavating.

B. The Contractor shall demolish and completely remove from the site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

1.08 DEFINITIONS

A. *Backfill*: Soil material or controlled low-strength material used to fill an excavation.

1. *Initial Backfill*: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. *Final Backfill*: Backfill placed over initial backfill to fill a trench.

B. *Base Course*: The course placed between the subbase course and hot-mix asphalt paving.

C. *Bedding Course*: The course placed over the excavated subgrade in a trench before laying pipe.

D. *Borrow Soil*: Suitable soil imported from off site for use as fill or backfill.

E. *Drainage Course*: The course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. *Excavation*: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. *Authorized Additional Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Engineer. Authorized additional excavation and replacement material will be paid for according to the Contract provisions for unit prices.
2. *Bulk Excavation*: Excavation more than 10 feet in width and more than 30 feet in length.
3. *Unauthorized Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be without additional compensation.

G. *Fill*: Soil materials used to raise existing grades.

H. *Structures*: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. *Subgrade*: The surface or elevation remaining after completing excavation, or the top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

J. *Utilities*: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.09 TESTING REQUIREMENTS

A. The Contractor shall furnish a soil survey for suitable material and samples of materials.

B. Testing for source material, for classification, and for prequalification of material (on or off site) shall be performed by an independent testing agency retained by the Contractor and approved by the Engineer.

C. Testing for in-place compacted fill shall be performed by the same independent testing agency as approved by the Engineer and retained by the Contractor.

D. The number and location of the tests shall be as specified in these Specifications and as directed by the Engineer during construction.

E. The Contractor shall coordinate activity with the Engineer and the testing agency to permit testing as directed in the presence of the Engineer.

F. The cost of all testing to achieve specified requirements shall be borne by the Contractor. The Contractor shall be reimbursed by the Owner for passing field tests.

G. The costs of any and all retests due to failure to achieve specified requirements shall be solely borne by the Contractor and are not reimbursable under this contract.

H. All materials proposed for use shall be tested as follows:

Material	Required Test	Min. No. Tests
Suitable Soil Materials	Soil Classification using ASTM D2487 (including all tests contained therein)	One per source of materials to determine conformance with materials specified this Specification; additional test whenever there is any apparent change.
	Soil moisture-density relationship using Modified Proctor ASTM D1557	One per source of material or apparent change in material.

I. Soil materials shall be tested during construction as follows:

Material	Required Test	Min. No. Tests
Suitable Soil Material in-place after compaction	Field Density ASTM D1556/1556M – Sand Cone Method, or ASTM D6938 – Nuclear Density Method, or ASTM D2937 – Drive Cylinder Method	For each layer of trench bottom subgrade before addition of soil materials, refill, bedding, and backfill, and for each 400 lineal feet of trench or fraction thereof, whichever is greater; two tests for each drainage, manhole, or wet well structure; additional test whenever there is any change in native soil, groundwater, or soil moisture conditions.

J. The approved testing agency shall transmit copies of required laboratory test results as follows:

1. One copy to the Owner.
2. Two copies to the Engineer.
3. Two copies to the Contractor.

The laboratory test reports shall include, at a minimum, project title; project location; location of sample; source, time, and date of testing; testing agency's name, address, and telephone number; and test results. Each test report shall be signed and sealed by the Professional Engineer representing the testing agency as specified in these Specifications.

K. The approved testing agency shall transmit copies of field testing results as follows:

1. One copy to the Owner.
2. Two copies to the Engineer.
3. Two copies to the Contractor.

The field test reports shall include, at a minimum, project title; project location; location of sample(s) tested; time of testing; date of testing; testing person's full name; testing agency name, address, and telephone number; and test results.

L. No soil material shall be used until 1) the Engineer has reviewed and approved test reports and 2) the Contractor submits certification that the soil material proposed for construction is clean and meets gradation and other parameters in these Specifications.

M. At no cost to the Owner, the Contractor shall remove and replace or correct all materials and work which tests indicate do not conform, in the opinion of the Engineer, to the requirements of these Specifications.

N. The results of in-place density tests shall be considered satisfactory if the density in each instance is equal to or greater than the specified density. Soil moisture content at the time of testing shall conform to requirements of these Specifications.

O. Where the tests reveal unsatisfactory compaction, the Contractor shall re-excavate, backfill, recompact, and/or rework the backfill as required to obtain the required degree of compaction over the entire depth of the excavation.

P. The testing agency shall transmit to the Engineer copies of all testing agency invoices submitted to the Contractor for payment. Invoices shall clearly indicate specific services and date and time services are rendered and shall indicate if the invoiced testing cost is an initial test of the Contractor's work or is a re-test required due to the Contractor's failure to initially achieve the specified requirements.

PART 2 PRODUCTS

2.01 STRUCTURAL MATERIALS

A. Materials used for shoring and bracing, such as sheet piling, uprights, stringers, and crossbraces, shall be in good serviceable condition. Any timber used shall be sound and free from large or loose knots.

B. Pressure-treated timber shall be used where wood sheeting or piling is specified or indicated to be cut and left in place.

2.02 TRENCH SOIL MATERIALS

A. Materials used for trench construction shall be free of clumps of clay, rock or gravel, debris, waste, frozen materials, and other deleterious matter as determined by the Engineer and shall be suitable soil materials as follows:

Area Classification	Soil Materials
In excavations and trenches	Excavated and borrow material that has been sampled, tested, and approved as "Suitable Soil Material."

B. Suitable Soil Materials

1. Soil Classification Groups: Suitable soil materials for each trench shall be as follows:

Suitable Soil Material (ASTM D487, Soil Classification Groups)		
In-situ Foundation	Bedding, Haunching, and Initial Backfill	Final Backfill
SW SP	SW SP	SW SP

2. Maximum Particle Size Limitations for Suitable Soil Materials: The maximum allowable particle size for suitable soil materials within each trench for each type of utility shall be as follows:

Conduit	Maximum Allowable Particle Size		
	In-situ Foundation	Bedding, Haunching, and Initial Backfill	Final Backfill
Plastic Pipe (PVC, CPVC, HDPE, etc.) less than 6-inch-diameter	See Note 1	1/2 inch	3 inches
Plastic Pipe (PVC, CPVC, HDPE, etc.) 6-inch-diameter and Larger	See Note 1	3/4 inch	3 inches
Concrete Pipe			
Steel Pipe			
Ductile Iron Pipe			
Fiberglass Pipe	See Note 1	3/4 inch or three times the wall thickness, whichever is less	3 inches
Other Conduit Materials	See Note 2	See Note 2	See Note 2

(1) There is no requirement when suitable undisturbed native soil material is used. Disturbed portions of the foundation and/or unsuitable native soil material shall be replaced with suitable soil materials meeting all the requirements for Bedding.
(2) The maximum allowable particle size shall be in accordance with the manufacturer's written recommendation.

3. Additional Requirements of Suitable Materials: Suitable soil materials shall be free of debris, waste, frozen materials, vegetation, or other deleterious matter. Soils within 4 inches of the exterior surface of the pipe shall be free of gravel, stones, or other materials which may abrade the pipe surface.

C. Unsuitable Materials

1. Unsuitable soil material shall mean ASTM D2487, Soil Classification Groups GW, GP, GM, GC, SC, CL, ML, OL, CH, MH, OH, PT, and other

highly organic soils and soil materials of any classification that have a moisture content at the time of compaction beyond the range of 1 percentage point below and 3 percentage points above the optimum moisture content of the soil material as determined by moisture-density relations test.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

The Contractor shall do the following:

A. Carefully verify by hand methods the location of all surrounding underground utilities before performing utility excavations and trenches.

B. Protect utilities to be left in place from damage.

C. Do not interrupt existing utilities serving facilities occupied and used by the Owner, except when permitted in writing by the Owner.

D. Protect benchmarks, survey points, and existing structures, roads, sidewalks, monitoring wells, paving, curbs, etc. against damage from equipment, vehicular or foot traffic, settlement, lateral movement, undermining, washout, and all construction-related activities.

E. Repair and replace damage to existing facilities to equal or better than their original undamaged condition without cost to the Owner and to the approval of the Engineer.

F. Excavate and trench in ways that will prevent surface water and subsurface water from flowing into excavations and will also prevent flooding of the site and surrounding area.

G. Protect excavations and trenching by shoring, bracing, sheet piling, underpinning, or other methods as required to prevent cave-ins or loose dirt from falling into excavations and trenches.

H. Do not operate earth-moving equipment within 5 feet of walls of concrete structures for depositing or compacting backfill material.

I. Compact the backfill material placed next to concrete walls with hand-operated tampers or similar equipment that will not damage the structure.

J. Excavate, fill, backfill, and grade to elevations required by the Contract Documents.

K. Pile excavated materials suitable for backfill in an orderly manner a sufficient distance from excavations to prevent overloading, slides, and cave-ins.

L. Do not obstruct access ways, roadways, and plant facilities.

M. Dewater excavations and trenches in accordance with Section 02240, Dewatering.

N. Refer to the Contract Drawings for additional requirements related to earthwork and protection of existing features.

3.02 TRENCH EXCAVATION

A. Before excavating the trench, the Contractor shall prepare the surface, including clearing and grubbing as specified in Section 02230, Site Preparation.

B. The Contractor shall be required to fully comply with all applicable OSHA Excavation Safety Standards and to abide by them as covered by the most current version of the Florida Trench Safety Act (90-96, Laws of Florida).

C. The Contractor shall ensure that mechanical equipment used for trench excavation shall be of a type, design, and construction and shall be so operated that conduit/ utility, when accurately laid to specified alignment, will be centered in the trench with adequate clearance between the conduit/utility and sidewalls of the trench. Undercutting the trench sidewall to obtain clearance will not be permitted.

D. The Contractor shall not use mechanical equipment in locations where its operation would cause damage to trees, buildings, culverts, other existing property, utilities, structures, etc. above or below ground. In all such locations, the Contractor shall use hand excavating methods.

E. The Contractor shall not use blasting.

F. The Contractor shall cut trenches sufficiently wide to enable proper installation of services and to allow for testing and inspection. The Contractor shall also trim and shape trench bottoms and leave them free of irregularities, lumps, and projections. Trench width shall be excavated as specified on the Contract Drawings.

G. The Contractor shall construct trench walls so as to avoid side wall collapse or sloughing. Trenches shall be either braced or open construction in accordance with the Contract Documents. No separate payment will be made for any special procedure used in connection with the excavation.

H. Where sheeting and bracing are not required, the Contractor shall construct trench walls in the bottom of the excavation as vertical as possible to the maximum height allowable by OSHA. Trench walls above this height shall be sloped to guard against side wall collapse or sloughing as specified on the Contract Drawings.

I. Where sheeting and bracing are required, the sheeting and bracing system shall meet the requirements specified in these Specifications.

J. Excavations shall be to the design elevations shown on the Contract Drawings or as specified, unless unsatisfactory or unsuitable foundation materials are encountered in the bottom of the excavation. Where unsatisfactory or unsuitable foundation materials are encountered, this material shall be undercut and removed as indicated on the Contract Drawings and replaced with suitable soil material meeting all the requirements for Bedding. The lift thicknesses and compaction requirements for the replacement soil shall also meet the requirements for Bedding.

K. The Contractor shall be careful not to overexcavate except where necessary to remove unsatisfactory or unsuitable materials, irregularities, lumps, rock, and projections. Unnecessary overexcavation shall be replaced as specified in these Specifications at the Contractor's sole expense.

L. The Contractor shall accurately grade bedding soil materials at the bottoms of the trenches to provide uniform bearing and support for each section of conduit/utility at every point along its entire length except where it is necessary to excavate the bedding for conduit/utility bells (e.g., pipe bells), etc. or for proper sealing of conduit/utility joints. Abrupt changes in grade of the trench bottom shall be avoided.

M. The Contractor shall dig bell holes and depressions after the bedding has been graded to ensure that the conduit/utility rests on the prepared bedding for as much of its full length as practicable. Bell holes and depressions shall be only of such length, depth, and width as required to make the joint.

N. The Contractor shall do the following:

1. Pile all excavated material in a manner that will not endanger the work or erode the stormwater management facilities or water courses.
2. Avoid obstructing sidewalks, driveways, and plant facilities.
3. Leave hydrants, valve pit covers, valve boxes, or other utility controls unobstructed and accessible.

4. Keep gutters, drainage inlets, natural water courses, and miscellaneous drainage structures clear or make other satisfactory provisions for their proper operation.

O. The Contractor shall keep all suitable materials that are suitable for use/reuse in the trench construction separated from unsuitable materials.

P. Except where otherwise authorized, indicated, or specified, the Contractor shall replace, at the Contractor's own expense, all materials excavated below the bottom of concrete walls, footings, slabs on grade, and foundations with concrete or flowable fill, as directed by the Engineer.

Q. The Contractor shall adhere to these Additional Excavation Requirements for piping:

1. Excavate trenches so that the piping can be laid to the lines, grades, and elevations indicated on the Contract Drawings.

2. For piping designated to be laid to a minimum cover requirement, grade trenches to avoid high and low points to the extent practical. Record Drawings of such pipes shall present top-of-pipe and grade elevations at all high and low points along each pipe segment, at the end points of each pipe segments, and at intervals not to exceed 100 feet along each pipe segment. If, in the opinion of the Engineer, additional air release and/or vacuum relief valves are required, the Contractor shall install the additional items as directed by the Engineer.

3. Except at locations specifically indicated otherwise on the Contract Drawings, the required minimum cover over the top of the pipe from finished grade for various pipe diameters shall be as follows:

	Pipe Diameter			
	48 inch or less	66 inch	72 inch	96 inch
Minimum Cover	3 feet	4 feet	4.5 feet	5 feet

Continue dewatering operations along each pipe segment until the required minimum cover is provided. During the dewatering operations, the groundwater level in the trench shall remain at all times a minimum of 1 foot below bottom of trench excavations.

R. The Contractor shall adhere to these Additional Excavation Requirements for Electrical Utilities:

1. Avoid abrupt changes in grade of the trench bottom.

2. The required minimum cover over the top of electrical conduits from finished grade shall be as follows:

	Electrical Conduits (Lines less than 5 kV)	Electrical Conduits (Lines 5 kV and up)
Minimum Cover	2 feet	3 feet

3. The required minimum clearance from the bottom of mat foundations and/or footings shall be 2 feet. Provide additional cover where necessary to satisfy the minimum clearance requirement.

4. Provide additional cover depth if necessary to avoid interference of other cables, ducts, piping, structures, and other utilities.

S. The Contractor shall adhere to this Additional Excavation Requirement for Appurtenances:

1. Ensure that excavations for valves and similar appurtenances shall be sufficient to leave at least 12 inches in the clear between the outer surfaces and the embankment or timber used to hold and protect the walls.

3.03 PROTECTION OF PERSONS AND PROPERTY

A. The Contractor shall do the following:

1. Barricade and post excavations with warning signs for the safety of persons. Provide warning lights during hours of darkness.
2. Protect structures, utilities, sidewalks, pavements, and other facilities immediately adjacent to excavations against damage, including loading, settlement, lateral movement, undermining, and washout.

B. Conduct topsoil removal operations to ensure the safety of persons and to prevent damage to existing structures and utilities, construction in progress, trees and vegetation to remain standing, and other property.

3.04 SHEETING AND BRACING

A. Where sheeting and bracing are required to support the side walls of the excavation, the Contractor shall retain a Professional Engineer, registered in Florida, to design sheeting and bracing. The design shall establish requirements for sheeting and bracing and shall comply with all applicable codes; authorities having jurisdiction; and federal, state, and local regulations.

B. The sole responsibility for the design, methods of installation, and adequacy of sheeting and bracing shall be and shall remain that of the Contractor and the Contractor's Professional Engineer. The Contractor shall provide all necessary sheeting and bracing or other procedures as required to ensure safe working conditions and to protect the excavations.

C. Sheeting and bracing shall consist of braced steel sheet piling, trench box, braced wood lagging, and soldier beams or other approved methods.

D. The Contractor shall immediately fill and compact voids formed outside the sheeting. Where soil cannot be properly compacted to fill the void, the Contractor shall use Class B concrete as backfill at no additional cost to the Owner.

E. The Contractor shall install sheeting outside the required clearances and dimensions. Sheeting shall be plumb, securely braced, and tied in position. Sheeting shall be adequate to withstand all pressure to which it may be subjected. The Contractor shall correct any movement or bulging at no expense to the Owner so as to provide the necessary clearances and dimensions.

F. The Contractor shall maintain sheeting and bracing in excavations and trenches for the entire time excavations will be open.

G. The Contractor shall not brace sheeting against pipe being laid. Sheeting shall be braced so that no concentrated load of horizontal thrust is transmitted to the pipe.

3.05 DEWATERING, WATER REMOVAL, AND DRAINAGE MAINTENANCE

A. Water shall not be permitted to accumulate in excavations. The Contractor shall provide dewatering systems to convey water away from excavations so that softening of foundations bottoms, footing undercutting, and soil changes detrimental to subgrade stability and foundation will not occur. Dewatering systems and methods of disposal shall be as specified in Section 02240, Dewatering, and as approved by the Engineer before being installed by the Contractor. Groundwater levels shall be maintained a minimum of 1 foot below bottom of trenches or excavations.

B. Dewatering systems and equipment shall be in place as required to eliminate water during the excavation period until the work is completed. The Contractor shall provide ample means and equipment with which to remove promptly and dispose of properly all water entering any excavation. This includes the use of sand or gravel as required to maintain adequate flow during the pipe laying or installation of other items of work within the excavation.

C. The Contractor shall dispose of water pumped or drained in a suitable manner without damage to adjacent property, to other work under construction, or to roads. Water shall not be discharged onto surface improvements without adequate protection of the surface at the point of discharge. All gutter, drains, culverts, sewers, and inlets shall be kept clean and open for surface drainage. Water shall not be directed across or over pavements except through approved pipes or properly constructed troughs. The Contractor shall obtain permission from the Owner of any property involved before constructing water courses or installing discharge pipe or hose for removal of water and provide for disposal of the water without ponding or creating a public nuisance.

D. All pumps used for dewatering shall have noise-reduction features and shall be able to run continuously with minimal attendance. If required by the Owner or Engineer, the pumps shall be enclosed on all sides with a plywood enclosure with padded material suitable for outdoor conditions on the inside of the enclosure to further reduce pump engine noise to an acceptable level. All applicable ordinances and codes for noise abatement shall be followed. The Contractor shall maintain pumps at all times, as necessary. When pumps are no longer required, the Contractor shall remove the pumps, wellpoints, pipes, and other apparatus from the area.

E. It is essential that the discharge of the trench dewatering pumps be conducted to natural drainage channels, drains, or storm sewers.

F. Trenches shall be constructed on the upstream side of the traffic way across roadways, driveways, or other traffic ways adjacent to drainage ditches or water to prevent impounding water after the pipe has been laid. The Contractor shall construct and maintain bridges and other temporary structures required to maintain traffic across such unfilled trenches. Backfilling shall be done so that water will not accumulate in unfilled or partially filled trenches. After backfilling is completed, the Contractor shall immediately remove all material deposited in roadway ditches or other water courses crossed by the line of trench and restore the original section, grades, and contours of ditches or water courses. Surface drainage shall not be obstructed longer than necessary.

G. Where trenches are constructed in ditches or other water courses, backfill shall be protected from surface erosion. Where the grade of the ditch exceeds 1%, the Contractor shall install ditch checks. Unless otherwise indicated on the Contract Drawings, ditch checks shall be concrete or as otherwise approved by the Engineer. Ditch checks shall extend not less than 2 feet below the original ditch or water course bottom for the full bottom width and at least 18 inches into the side slopes and shall be at least 12 inches thick.

3.06 BACKFILLING AND COMPACTION

A. Backfill and compaction shall be according to the recommendations of the Geotechnical Report provided as an Appendix to these Specifications.

B. The Contractor shall not backfill trenches until required tests are performed.

C. Trenches improperly backfilled shall be reopened to the depth required for proper compaction, then refilled and compacted as specified, or the condition shall be otherwise corrected as directed.

D. The Contractor shall perform the following steps to ensure compaction at the bottom of the trench or excavation before bedding:

1. Remove disturbed native soil material and/or any soils not meeting the requirement of suitable soil material as indicated on the Contract Drawings.
2. Compact the bottom of the trench excavation (undisturbed native subsurface soil) to no less than 95% of the Modified Proctor maximum dry density in accordance with ASTM D1557, before placement of foundation, bedding, piping, and backfill.

E. To backfill below and around pipe to the spring line of the pipe, the Contractor shall do the following:

1. Construct foundation and bedding as indicated on the Contract Drawings before placement of pipe.
2. Install each pipe at proper grade, alignment, and final position.
3. Deposit suitable soil material uniformly and simultaneously on each side of pipe in completed course layers to prevent lateral displacement.
4. Compact under pipe haunches and on each side of pipe to the pipe spring line as shown on the Contract Drawings to hold the pipe in the proper position during subsequent pipe backfilling and compaction operations.
5. Construct haunching as indicated on the Contract Drawings.

F. To trench backfill above pipe spring line to finished grade, the Contractor shall do the following:

1. Deposit suitable soil material around and above pipe in uniform layers as shown on the Contract Drawings.
2. Backfill and compact trenches from the spring line of the pipe to the top of the trench in completed course layers as shown on the Contract Drawings.

3. Use material previously defined in these Specifications as suitable soil material.
4. Compact by hand or mechanical tampers.

3.07 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. The Contractor shall remove and legally dispose of waste materials, including excavated material classified as unsuitable soil material, trash, and debris from the property at no additional cost to the Owner.

END OF SECTION

SECTION 02370
EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall take every reasonable precaution throughout construction to prevent the erosion of soil and the sedimentation of streams, bays, storm systems, or other water impoundments, ground surfaces, or other property as required by federal, state, and local regulations.

B. The Contractor shall provide protective covering for disturbed areas upon suspension or completion of land-disturbing activities. Permanent vegetation shall be established at the earliest practicable time. Temporary and permanent erosion-control measures shall be coordinated to ensure economical, effective, and continuous erosion and siltation control throughout the construction and post-construction period.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Department of Transportation (FDOT)

1. FDOT Section 103—Temporary Work Structures.
2. FDOT Section 104—Prevention, Control, and Abatement of Erosion and Water Pollution.
3. FDOT Section 530—Revetment Systems.
4. FDOT Section 982—Fertilizer.
5. FDOT Section 985—Geosynthetic Materials.

1.04 REGULATORY REQUIREMENTS

A. The Contractor shall prevent damage to properties outside the construction limits from siltation due to construction of the project and assume all responsibilities to the affected property owners for correction of damages which may occur. Erosion-control measures shall be performed conforming to the requirements of and in accordance with plans approved by applicable state and local agencies and as specified by the erosion-control portion shown on the Drawings and as required by these Specifications. The Contractor shall not allow mud and debris to accumulate in the streets or enter drainage ditches, canals, or waterways. Should the Contractor pump water from excavations during construction, appropriate siltation preventative measures shall be taken before the pumped water is discharged into any drainage ditch, canal, or waterway.

1.05 PRACTICES

The Contractor shall adhere to the following:

A. Avoid dumping soil or sediment into any stream bed, pond, ditch, or watercourse.

B. Maintain an undisturbed vegetative buffer where possible between a natural watercourse and trenching and grading operations.

C. Avoid equipment crossings of streams, creeks, and ditches where practicable.

1.06 EROSION AND SEDIMENT-CONTROL DEVICES AND FEATURES

A. The Contractor shall construct all devices (silt fences, retention areas, etc.) for sediment control at the locations required to protect federal, state, and local water bodies and water courses and drainage systems before beginning to excavate the site. All devices shall be properly maintained in place until a structure or paving makes the device unnecessary or until directed to permanently remove the device.

B. The Contractor shall use mulch to temporarily stabilize areas subject to excessive erosion and to protect seed beds after planting where required.

C. Filter fabric, hay bales, or other approved methods shall be placed and secured over the grates of each existing inlet, grating, or storm pipe opening near the area of excavation to prevent silt and debris from entering the storm systems.

D. The Contractor shall use silt fences, hay bales, and floating turbidity barriers as shown on the plans or as directed by the Owner or Owner’s Representative to restrict movement of sediment from the site.

E. The Contractor shall establish vegetative cover on all unpaved areas disturbed by the work.

PART 2 PRODUCTS

2.01 GENERAL

A. Open-mesh biodegradable mulching cloth.

B. Fertilizer shall be 10-10-10 grade or equivalent.

C. Lime shall be Dolomitic Agricultural Ground limestone, in accordance with FDOT Section 982.

D. Grass shall be in accordance with Section 02920, Seeding and Sodding.

E. Silt fence shall consist of non-biodegradable filter fabric (Trevira, Mirafi, etc.), in accordance with FDOT Section 985, wired to galvanized wire mesh fencing and supported by wood or metal posts.

F. Floating or staked turbidity barriers as specified in FDOT Section 985 and FDOT Section 104.

G. Erosion Stone: FDOT Section 530.

1. Sand-Cement Riprap.
2. Concrete Block.
3. Rubble 20 to 300 pounds each.

H. Filter Fabric for placing under Riprap shall meet the requirements of FDOT Section 985.

I. Baled hay or straw in accordance with FDOT Section 104.

PART 3 EXECUTION

3.01 CLEARING

A. The Contractor shall schedule and perform clearing and grubbing so that subsequent grading operation and erosion-control practices can follow immediately after. Excavation, borrow, and embankment operations will be conducted as a continuous operation. All construction areas not otherwise protected shall be planted with permanent vegetative cover within 30 working days after completing active construction.

3.02 STABILIZING

A. The angle for graded slopes and fills shall be no greater than the angle that can be retained by vegetative cover or other adequate erosion-control devices or structures. All disturbed areas outside of embankment left exposed will, within 30 working days of completion of any phase of grading, be planted or otherwise provided with either temporary or permanent ground cover, devices, or structures sufficient to restrain erosion.

3.03 REGULATORY REQUIREMENTS

A. Whenever land-disturbing activity is undertaken on a tract, a ground cover sufficient to restrain erosion must be planted or otherwise provided within 30 working days on that portion of the tract upon which further active construction is to be undertaken.

B. If any earthwork is to be suspended for any reason for longer than 30 calendar days, the areas involved shall be seeded with vegetative cover or otherwise protected against excessive erosion during the suspension period. Suspension of work in any area of operation does not relieve the Contractor of the responsibility to control erosion in that area.

3.04 VEGETATIVE COVER

A. Preparation of Seedbed. Areas to be seeded shall be scarified a depth of 4 inches until a firm, well-pulverized, uniform seedbed is prepared. Fertilizer shall be applied during the scarification process in accordance with the following rates:

1. Fertilizer—10 to 15 pounds per 1,000 square feet.

B. Seeding. Disturbed areas along embankments shall be permanently seeded with mix specified in Section 02920, Seeding and Sodding.

C. The Contractor shall mulch all areas immediately after seeding. Mulch shall be applied and anchored as specified previously in this Section.

3.05 MAINTENANCE

A. The Contractor shall maintain all temporary and permanent erosion-control measures in functioning order. Temporary structures shall be maintained until such time as vegetation is firmly established and grassed areas shall be maintained until completion of the project. Areas which fail to show a suitable stand of grass or which are damaged by erosion shall be immediately repaired. No additional

payment will be made to the Contractor for re-establishing erosion-control devices, which may become damaged, destroyed, or otherwise rendered unsuitable for their intended function during the construction of the project.

B. The Contractor shall remove all silt, sediment, and debris buildup regularly to maintain functioning storm systems and erosion-control devices.

3.06 REMOVAL OF SEDIMENT CONTROL DEVICES

A. Near completion of the project, when directed by the Engineer, the Contractor shall dismantle and remove the temporary devices used for sediment control during construction. All erosion-control devices in seeded areas shall be left in place until the grass is established. The Contractor shall seed areas around devices and mulch after removing or filling temporary control devices.

B. The Contractor shall clean up all areas at the completion of the project.

END OF SECTION

SECTION 02700
EARTHWORK, PAVING, AND MARKINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to provide for the construction of all pavement and work related to roadways where indicated on the Drawings.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Limerock material submittal is to be made to include liquid limit, plastic index, gradation, certification regarding deleterious material, limerock bearing ratio (LBR), Florida Department of Transportation (FDOT) pit number, and other information as required to indicate performance in accordance with the specifications.

B. Information regarding asphaltic concrete materials and mix shall be submitted as required by the referenced FDOT specifications.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time, unless otherwise noted. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section.

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this Contract.
2. The Contractor shall retain an independent testing agency, as approved by the Engineer, to perform all tests, including tests referenced to be performed by the Engineer.
3. Payment for this project is in accordance with the Bid Form.

B. American Society of Testing and Materials (ASTM)

1. ASTM D1556/D1556M—Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
2. ASTM D1557—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).
3. ASTM D2167—Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
4. ASTM D6938—Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.04 QUALITY ASSURANCE

A. The Contractor shall perform field-density tests along the centerline of construction or as directed by the Engineer and in accordance with the FDOT's *Standard Specifications for Road and Bridge Construction*, latest edition, FDOT Standard.

B. The Contractor shall field check the depth of stabilization and/or limerock at each road crossing with a pipeline.

C. The Engineer may require additional testing as deemed necessary. The Engineer shall interpret test results and the Contractor shall perform remedial work as directed by the Engineer. The Contractor shall provide labor to the Engineer for help in performing tests and/or checking line and grade at no additional cost to the Owner.

D. Laboratory maximum dry density of soil mixtures at optimum moisture shall be determined by ASTM D1557 for subgrade, stabilized subgrade, and limerock base course.

E. Field density of stabilized subgrade and soils or soil mixtures in fill or backfill shall be determined by ASTM D1556/D1556M, D2167, or D6938 for limerock base course.

F. Bearing value of stabilized subgrade shall be determined by the methods required for determining limerock bearing ratio (LBR) according to the FDOT, Standard Specification FM 5-515.

G. Field density of stabilized subbase shall be 98% or greater of the Modified Proctor maximum dry density, ASTM D1557.

H. Field density of limerock base course shall be 98% or greater of the Modified Proctor maximum dry density, ASTM D1557.

I. The Engineer shall have sole responsibility for interpreting all test results. The Contractor shall bear the cost of all retests due to failure to achieve specified requirements.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING (NOT USED)

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS

2.01 GENERAL (NOT USED)

2.02 ROCK BASE

A. The following sections of the Standard Specifications shall apply:

1. Section 200-1, Description.
2. Section 200-2, Materials.

2.03 STABILIZING MATERIALS

A. The following sections of the Standard Specifications shall apply:

1. Section 160-1, Description.
2. Section 160-2, Materials.

2.04 PRIME AND TACK COATS FOR BASE COURSES

A. The following sections of the Standard Specifications shall apply:

1. Section 300-1, Description.
2. Section 300-2, Materials.

2.05 ASPHALT

A. The following sections of the Standard Specifications shall apply:

1. Superpave Asphalt Concrete:

a. Section 334-1, Description.
b. Section 334-2, Materials.
c. Section 334-3, General Composition of Mixture.
d. Section 334-5, Acceptance of the Mixture.

2. Asphalt Concrete Friction Courses:

a. Section 337-1, Description.
b. Section 337-2, Materials.
c. Section 337-3, General Composition of Mixes.
d. Section 337-4, Mix Design.
e. Section 337-6, Acceptance of the Mixture.

2.06 RAISED RETROREFLECTIVE PAVEMENT MARKERS

A. The following sections of the Standard Specifications shall apply:

1. Section 706-1, Description.
2. Section 706-2, Materials.

2.07 TRAFFIC STRIPES AND MARKINGS

A. The following sections of the Standard Specifications shall apply:

1. Painted Pavement Markings:

a. Section 710-1, Description.
b. Section 710-2, Materials.

2. Thermoplastic Pavement Markings:

a. Section 711-1, Description.
b. Section 711-2, Materials.

PART 3 EXECUTION

3.01 EXCAVATION AND EMBANKMENT

A. The following sections of the Standard Specifications shall apply:

1. Section 120-1, Description.
2. Section 120-2, Classifications of Excavation.
3. Section 120-3, Preliminary Soils Investigation.
4. Section 120-4, Removal of Unsuitable Materials and Existing Roads.
5. Section 120-5, Disposal of Surplus and Unsuitable Material.
6. Section 120-6.1, Materials for Borrow.
7. Section 120-7, Materials for Embankment.
8. Section 120-8, Embankment Construction.
9. Section 120-9, Compaction Requirements.
10. Section 120-10, Acceptance Program.
11. Section 120-11, Maintenance and Protection of Work.
12. Section 120-12, Construction.

B. Exceptions

1. Section 120-4.1, Subsoil Excavation: Unsuitable soils shall be those in Classifications A-6, A-7, or A-8 in the American Association of State Highway and Transportation Officials (AASHTO) System.
2. Section 120-4.2, Construction Over Existing Old Road: Where removal of existing pavement is called for, it shall be removed to the full depth as indicated in the cross-sections and replaced with new limerock and paving or other treatment in accordance with the Drawings and details.
3. Section 120-5.2, Disposal of Muck on Side Slopes: Disposing of muck on side slopes shall not apply.
4. Section 120-9.2.1, General: Laboratory maximum dry density shall be determined by Modified Proctor, ASTM D1557. Field densities shall be determined by ASTM D1556/D1556M, D2167, or D6938. All embankments shall be compacted to not less than 95% of the maximum dry density, as determined by modified Proctor, ASTM D1557.
5. Section 120-12.1, Construction Tolerances: No tolerance greater than 0.1-foot above or below the plan cross-section will be allowed.

3.02 STABILIZING

A. The following sections of the Standard Specifications shall apply:

1. Section 160-3, Construction Methods.
2. Section 160-4, Acceptance Program.

B. Exceptions

1. Section 160-2.4, Granular Subbase: The Contractor may not substitute 6 inches of Granular Subbase for 12 inches of Stabilization unless such substitution is specifically indicated on the Drawings.
2. Section 160-4.2.1.2, Undertolerance in Bearing Value Requirements: no undertolerance will be acceptable.

3.03 LIMEROCK BEARING RATIO AND DENSITIES

A. Stabilized finish grade and stabilized shoulders shall have a minimum Limerock Bearing Ration (LBR) value of 40.

B. Field density of stabilized finished grade shall be a minimum of 98% of the Modified Proctor maximum dry density as specified in ASTM D1557 to a minimum depth of 12 inches as shown on the Drawings.

3.04 PRIME AND TACK COATS

A. The following sections of the Standard Specifications shall apply:

1. Section 300-3, Equipment.
2. Section 300-5, Cleaning Base and Protection of Adjacent Work.
3. Section 300-6, Weather Limitations.
4. Section 300-7, Application of Prime Coat.
5. Section 300-8, Application of Tack Coat.

3.05 ROCK BASE

A. The following sections of the Standard Specifications shall apply:

1. Section 200-3, Equipment.
2. Section 200-4, Transporting Rock.
3. Section 200-5, Spreading Rock.
4. Section 200-6, Compacting and Finishing Base.
5. Section 200-7, Acceptance Program.
6. Section 200-8, Priming and Maintaining.

B. Exceptions

1. Section 200-7.2.1, Density: The minimum density which will be acceptable for paved areas will be 98% of the maximum dry density as determined by Modified Proctor, ASTM D1557.

2. Section 200-7.3.1.2, Depth and Surface Testing Requirements: Thickness of base shall be measured at intervals not to exceed 200 feet.

3.06 ASPHALT

A. The following sections of the Standard Specifications shall apply:

1. Hot Mix Asphalt – Plant Methods and Equipment:

a. Section 320-6, Preparation of the Mixture.
b. Section 320-7, Transportation of the Mixture.

2. Hot Mix Asphalt – General Construction Requirements:

a. Section 330-1, Description.
b. Section 330-2, Quality Control (QC) Requirements.
c. Section 330-3, Limitations of Operations.
d. Section 330-4, Surface Preparation.
e. Section 330-5, Paving Equipment.
f. Section 330-6, Placing Mixture.
g. Section 330-7, Compacting Mixture.
h. Section 330-8, Joints.
i. Section 330-9, Surface Requirements.
j. Section 330-10, Protection of Finished Surface.

B. The Engineer reserves the right to test any portion of the roadway at any time.

C. Asphalt spread rate, tack, and temperature will be kept by the person responsible for quality control, and may be checked by the project's resident observer at any time.

3.07 PAVEMENT REPAIR

A. At his own expense the Contractor shall repair all damage to pavement as a result of work under this Contract in a manner satisfactory to the Engineer. Pavement shall be repaired to match the original surface material thickness and original grade. However, the asphalt concrete thickness shall not be less than 2 inches. The repair shall include preparing the subgrade, placing and compacting the applicable base, priming the limerock base, and placing and maintaining the surface treatment as specified in this Section.

B. The width of all repairs shall extend at least 12 inches beyond the limit of the damage. The edge of the pavement to be left in place shall be cut to a true edge with a saw or other approved method so as to provide a clean edge to abut the

repair. The line of the repair shall be reasonably uniform with no unnecessary irregularities.

3.08 JOINTS

A. General pavement joints within asphalt or concrete driveways and roadways and where specified or directed by the Engineer, shall be mechanically sawed butt joints. The edges of asphalt pavement shall be trimmed to straight lines which a roller can follow or formed.

3.09 RAISED RETROREFLECTIVE PAVEMENT MARKERS

A. The following sections of the Standard Specifications shall apply:

1. Section 706-3, Equipment.
2. Section 706-4, Application.
3. Section 706-5, Contractor's Responsibility for Notification.

3.10 TRAFFIC STRIPES AND MARKINGS

A. The following sections of the Standard Specifications shall apply:

1. Painted Pavement Markings:

    a. Section 710-3, Equipment.
    b. Section 710-4, Application.
    c. Section 710-5, Tolerances in Dimensions and in Alignment.
    d. Section 710-6, Contractor's Responsibility for Notification.
    e. Section 710-7, Protection of Newly Painted Pavement Markings.

2. Thermoplastic Pavement Markings:

    a. Section 711-3, Equipment.
    b. Section 711-4, Application.
    c. Section 711-5, Contractor's Responsibility for Notification.
    d. Section 711-6, Protection of Newly Applied Traffic Stripes and Markings.

END OF SECTION

SECTION 02740
DIRECTIONAL DRILLING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes furnishing all labor, materials, equipment, and incidentals necessary to complete each directional drill installation shown on the Drawings and as specified herein.

1.02 SUBMITTALS

The following shall be submitted in sufficient detail to show full compliance with the specification:

A. Qualifications: Submit statement of qualifications and records of previous similar jobs.

B. Product Pipe: Submit manufacturer's catalog data for the product pipe as required in the pipe specifications. The product data shall also include the dimension ratio, minimum allowable bending radius, and the safe pull force for each product pipe being installed by directional drill.

C. Drilling Fluids: Submit a complete list of all drilling fluids, additives, and mixtures to be used along with Material Safety Data Sheets.

D. Software: Submit indication of the software that the Contractor will use to perform analyses in accordance with Article 1.03, Quality Assurance.

E. Analyses: Submit software analyses results in accordance with Article 1.03, Quality Assurance.

F. Contingency Plan: Submit a hydraulic fracture (frac-out) contingency plan in accordance with Article 1.03, Quality Assurance.

G. Equipment: Submit a description of the rig(s) proposed for the project at each location, showing the method of control of the boring head, head type, pulling force of the equipment, age, reamer type(s), manufacturer type, and other germane information. This information shall demonstrate that the equipment pulling force is at least 1.25 the maximum calculated peak-pulling requirement.

H. Certificates: Submit statement that the Contractor has inspected the drill equipment including the drill rod and determined that they are in satisfactory condition for its intended use.

I. Bore Plan: The Contractor shall submit a signed-and-sealed bore plan before commencing drilling activities.

J. Record Drawings: Submit an electronic copy and three hard copies of the record drawings within 5 days after completing the pull back in accordance with the Article 1.06, Record Drawings.

K. Drilling Logs: Maintain and submit upon completion of work complete drilling logs of guided directional drill operations.

1.03 QUALITY ASSURANCE

A. The proposed product pipe installation lengths, depths, and curvatures presented on the Drawings are for bidding purposes only. The Contractor shall be solely responsible for the successful installation of each product pipe. The Contractor shall analyze each installation and make modifications necessary to successfully install each product pipe.

B. The Contractor shall analyze each installation using BoreAid ™, DrillPath ™, or other approved software and perform hand calculations as necessary if the Contractor's software is not capable performing all of the required analyses. The results of the analyses/calculations shall be submitted and shall include as a minimum the following:

1. Proposed entry and exit angles.
2. Proposed radii of curvature for all directional changes.
3. Proposed profile and drill path. The profile shall show ground surfaces, waterway bottoms/beds (if applicable), and proposed product pipe installation.
4. Product pipe deflection, buckling, external pressure, and stress calculations demonstrating that the forces/stresses exerted on the product pipe during and after installation will not exceed 80% of the manufacturer's safe limits.
5. Pull back force calculations demonstrating that peak pulling requirement does not exceed 80% of the manufacturer's safe pull pack force.
6. Maximum borehole pressure calculations and demonstration that the maximum borehole pressure will not result in a hydraulic fracture (frac-out).
7. Method of buoyancy control (if required/used) to reduce forces/stresses exerted on the product pipe.

C. The Contractor shall submit a frac-out contingency plan that describes frac-out planning, prevention, monitoring, response, notification to the Owner, Engineer, and regulatory agencies, and cleanup procedures.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Delivery, storage, and handling shall be in accordance with Section 01650, Delivery, Storage, and Handling, and the additional requirements herein.

B. Inspect materials delivered to the site for damage. All materials found during inspection or during the progress of work to have cracks, flaws, surface abrasions, or other defects shall be rejected and removed from the job site.

C. Disposal of fluids is the responsibility of the Contractor. Disposal of fluids shall be done in a manner that is in compliance with all permits and applicable federal, state, and local regulations.

1.05 QUALIFICATIONS

A. The Contractor's superintendent and driller assigned to this project must be experienced in work of this nature and must have successfully completed a minimum of five similar projects of similar length, pipe type, pipe size, and soil type using directional drilling in the last 3 years. Conventional open-trenching experience or bore-and-jacking experience will not be acceptable substitutes for directional drilling experience.

B. As part of the bid submission, the Contractor shall submit documentation of such project(s). The documentation for experience shall include but not be limited to the following:

1. Name(s) and description(s) of project(s).
2. Résumés of project manager, superintendent, and driller assigned to the specific project.
3. Pipe type(s), diameter(s), and lengths.
4. Type and manufacturer of equipment used.
5. Soil conditions encountered.
6. Start and completion dates.
7. Contact names, numbers, and addresses.

1.06 RECORD DRAWINGS

A. The record drawings shall include a plan, profile, and all information recorded during the progress of the work. The Record Drawings shall be tied to the project's survey control.

1.07 DEFINITIONS

A. *Horizontal Directional Drilling (HDD):* A steer-able system for the underground installation of pipes, conduits, and cables using a surface launched rig. A pilot bore is drilled using a rotating drill string and then is enlarged by a back reamer to the size required for the product pipe. The necessary deviation during pilot boring is provided by a slanted face to the drill head, an asymmetric drill head, eccentric fluid jets, or a combination of these, usually in conjunction with an aboveground electronic locator or a remote guidance system.

B. *Maxi (Conventional) HDD*: Typically used for the largest-diameter pipelines/ conduits and longest length installations. Pipe diameters are typically 18 inches or larger, lengths can exceed 1,000 feet, and the pullback force is typically in excess of 70,000 pounds. The drill string is usually remote tracked provided from sensors near the leading end of the drill string.

C. *Mini HDD:* Typically used for the smaller diameter pipelines/conduits and for shorter distances. Pipe diameters are typically 6 inches or smaller, lengths are less than 600 feet, and pullback forces are up to 20,000 pounds. The drill string is typically tracked with a surface held walkover transmitter/receiver.

D. *Midi HDD:* Typically used for intermediate sizes and lengths of pipelines/ conduits. Pipelines are typically between 6 inches and 18 inches diameter, lengths are up to 1,000 feet, and pullback forces from 20,000 to 70,000 pounds. Midi HDD equipment may employ similar capabilities to the Maxi HDD rigs but have more limitations on capacity. The drill string is typically tracked with a surface held walkover transmitter/receiver.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Boring equipment shall be matched to the conditions of the project and shall have a pulling force at least 1.25 the maximum calculated peak-pulling requirement for each installation given the site-specific conditions.

B. Boring equipment shall have a mechanical drilling rig with a controlled directional boring head using either a fluid or mechanical cutting head (or

combination of both), assisted and cooled by an approved drilling fluid of low pressure and volume.

C. Approved boring equipment shall be that manufactured by American Augers, Case Construction, Charles Machine Works (Ditch Witch), Straight Line, Tulsa Rig Iron, Vermeer, or approved equal.

D. The location/tracking system employed for determining the location of the drilling head during the pilot bore shall include but not be limited to the position of the boring head, the roll angle, the tilt angle, depth below grade, temperature of data transmitter, and remaining battery life.

E. The Contractor shall select the appropriate drill equipment, which at least meets the minimum requirements established in this specification, to be used for this project.

F. The drill equipment including rod shall be inspected and approved for use by the Contractor before arrival at the work site.

2.02 DRILLING FLUIDS

A. A high-quality drilling fluid shall be used to ensure hole stability, cuttings transport, bit and electronics cooling, and hole lubrication to reduce drag on the drill pipe and the product pipe. Composition of the fluid must comply with all federal, state, and local environmental regulations.

B. The drilling fluid shall be a bentonite slurry mixed with potable or reclaimed water (of proper pH) to ensure no contamination is introduced into the soil during the drilling, reaming, or pipe installation process. The Contractor is responsible for any required pH adjustments. A polymer-based slurry will be considered only if the Contractor demonstrates that a bentonite slurry will not suitable for this project and the proposed polymer slurry is acceptable to the Florida Department of Environmental Protection. Drilling fluids that are petroleum-based or that contain additives that may contaminate the surrounding soils or groundwater shall not be allowed.

C. The type of proposed drilling fluid with a complete listing of all additives along with Material Safety Data Sheets shall be submitted for approval before work begins.

D. Potable water or reclaimed water will be made available to the Contractor. This water will be metered and invoiced to the Contractor at the current effective rate.

2.03 PRODUCT PIPE

A. The nominal diameter and material type of each product pipe shall be as shown on the Drawings.

B. High-Density Polyethylene (HDPE) pipe shall conform to the requirements of Section 15146, High-Density Polyethylene (HDPE) Pipe. The maximum dimension ratio (i.e., the thinnest allowable wall thickness) for HDPE pipe being installed by direction drill shall be 11 (DR11).

PART 3 EXECUTION

3.01 GENERAL

A. No work or drilling shall commence until the Contractor has submitted the required information and a signed-and-sealed bore plan and received written approval from the Engineer regarding the drill path and related procedures.

B. The Contractor shall locate all utilities, structures, etc., within the construction area before any work begins and before equipment is mobilized.

C. Before drilling operations begin, all erosion control devices and dewatering shall be in-place and functional in accordance with Section 02240, Dewatering, and the Contract Documents.

D. The boring rig shall be sufficiently and adequately anchored for the task.

E. Directional drilling equipment machine safety requirements shall include common grounding system to prevent electrical shock in the event of underground electrical cable strike. The grounding system shall connect all pieces of interconnecting machinery; the drill, mud mixing system, drill power unit, drill rod trailer, operator’s booth, worker grounding mats, and any other interconnected equipment to a common ground. The drill shall be equipped with an "electrical strike" audible and visual warning system that will notify the system operators of an electrical strike.

F. The Contractor shall conform to all requirements of Section 02305, Earthwork for Utilities, including, but not limited to, excavation, protection of persons and property, sheeting and shoring, backfill and compaction, and disposal of excess and waste materials.

G. The Contractor shall be responsible for transporting, containing, and storing any water required for the drilling operations, cleanup, and other needs.

H. All drilling fluid excess shall be contained in entry and/or exit pits and pumped/treated/stored as needed to preclude spills and escape to the surrounding environment. Ensure that entry and exit pits are of sufficient size and volume to contain the expected return of drilling fluids and cuttings.

I. Drilling fluid returns can be collected in the entrance pit, exit pit, or spoils recovery pit. The Contractor shall immediately clean up any drilling fluid spills or overflows from these pits.

J. Disposal of the drilling fluids shall be the responsibility of the Contractor and shall be conducted in compliance with all relative environmental regulations, right-of-way and workspace agreements, and permit requirements.

K. The product pipe shall be installed within the limits indicated on the Drawings.

3.02 DRILL SET-UP AND PITS

A. The Contractor may use the set-up areas identified on the Drawings. If additional areas are required, the Contractor shall be responsible for coordinating the additional areas at no additional cost to the Owner.

B. Drill entrance and exit pits are required. The Contractor shall be responsible for design and construction of the drill entrance and exit pits.

C. The drill entrance and exit pits shall be maintained at minimum size to allow only the minimum amount of drilling fluid storage before transfer to mud recycling or processing system or removal from the site.

D. Drilling mud shall not be allowed to flow freely on the site or around the entrance or exit pits. Erosion and sediment control devices shall be set up around each pit. Mud spilled shall be removed as soon as possible and the ground restored to original condition. Pits shall be shored to OSHA standards and the requirement of Section 02305, Earthwork for Utilities.

3.03 DRILL ENTRANCE AND EXIT ANGLE

A. The entrance and exit angles shall such that the elevation profile maintains adequate cover to reduce risk of frac-out and that ground exit occurs as specified herein. The Contractor shall be responsible for ensuring that entrance and exit angles ensure pullback forces do not over stress the pipe.

B. In no case shall the entry or exit angles of the installed pipeline shall be less than 8 degrees from the horizontal and or more than 18 degrees from the horizontal.

C. In addition to the allowable limits of Paragraph 3.04B, the entry and exit angles shall in accordance with those used in the analyses performed in Article 1.03, Quality Assurance.

3.04 PILOT HOLE

A. A pilot hole shall be drilled for all product pipe installations 6-inch-diameter and larger.

B. The type and size of the pilot string cutting head and the diameter of the drill rod shall be selected by the Contractor for each specific application.

C. The cutting head shall be assisted by and cooled by drilling fluid of low pressure and volume.

D. The pilot hole shall be drilled along the approved path. Pilot hole tolerances are as follows:

1. Vertical tolerance: Provide cover in accordance with the approved profile developed under Article 1.03, Quality Assurance.
2. Horizontal tolerance: 3 feet from the centerline of the product pipe.
3. Curve Radius: No curve will be accepted with a radius less than 1.25 times the manufacturer's recommended minimum bending radius for the product pipe being installed by directional drill. NOTE: There are additional stresses imposed on the product pipe due to pulling it around curves versus bending the product pipe in a trench. The minimum bending radius for a product pipe installed by direction drill is greater than the minimum bending radius for the same product pipe installed in a trench.
4. Entry Point Location: The pilot hole entry point shall be established by the Contractor.
5. Exit Point Location: The exit point location shall be established by the Contractor.
6. The installed pipeline cover requirements as shown on the drawings and as specified herein shall not be violated.

E. If significant differing soils or strata from those provided in the geotechnical data and reports are encountered during the pilot boring, the Contractor shall be responsible for changing the drill head and slurry and other means as may be appropriate to complete the bore.

F. The Contractor shall adjust the viscosity of the drilling fluid to match the conditions of the project. The Owner shall bear no responsibility for loss of drilling fluid or loss of drilling equipment if an obstacle or unknown condition is encountered during the work.

G. The Owner shall not be responsible for underground obstacles (such as boulders, tree stumps, loose and unconsolidated soils, hard rock, or utilities) or structures that may be encountered during the work.

H. If hydraulic fracture occurs, the Contractor shall implement the approved frac-out contingency plan and repair all related damages, cleanup of fluids, and make corrections to preclude future events. Such corrections may include but not be limited to re-profiling the bore or changing the viscosity of the drilling fluid or plugging the fracture or a combination of these. If the borehole is abandoned and an alternate route is chosen, the abandoned borehole shall be filled with excavatable flowable fill.

I. Where construction activities are close to or under water bodies (lakes, creeks, canals, retention basins) or wetlands, special attention shall be given to the proposed profile to ensure that hydraulic fracture does not occur under the water feature. Additionally, silt fences and similar approved erosion control devices shall be used to protect the water body(s) from the construction activities.

3.05 BACK-REAMING

A. Back-reaming shall be required for all product pipe installation 6-inch-diameter and larger.

B. The type of back-reamer to be utilized shall be determined by the type of subsurface soil conditions that are encountered during the pilot hole drilling operation. The back-reamer type shall be selected by the Contractor for each specific application.

C. Back-reaming shall be conducted in single or multiple passes of the borehole and shall enlarge the borehole to at least 1.4 times the outer diameter of the product pipe to be installed. Larger reaming may be required depending on subsurface conditions encountered. The number of back-reaming passes and the borehole size, provided the minimum requirements are met, shall be the Contractor’s discretion.

3.06 PULL BACK

A. Unless approved otherwise, the entire product pipeline to be installed via directional drill shall be fully assembled before commencement of pull back operations.

B. The product pipeline shall be supported during pullback operations in a manner to enable it to move freely and prevent damage. Properly spaced rollers and at

proper heights shall be used to transition the product pipe from the horizontal to oblique positions for insertion into the borehole.

C. Unless approved otherwise, the product pipeline shall be installed in one continuous pull.

D. The product pipe shall be installed with a continuous #10-gauge tracer wire of sufficient type to remain intact and usable upon completion of the installed product pipe.

E. Torsional stress shall be minimized by using a swivel to connect the pull section to the reaming assembly.

F. Maximum allowable tensile force imposed on the pull section shall not exceed 80% of the pipe manufacturer's safe pull (or tensile) strength. If the pull section is made up of multiple pipe size or materials, the lowest safe pull strength value shall govern and the maximum allowable tensile force shall not exceed 80% of this value.

G. External pressure shall be minimized during installation of the pullback section in the reamed hole. Damaged pipe resulting from external pressure shall be replaced at no cost to the Owner. Buoyancy modification shall be at the discretion of the Contractor.

H. The Contractor shall take precautions to protect the product pipeline from damage and marring during the installation and pullback operation. Such precautions shall include but not be limited to using rollers, pulleys, idlers, and trunnions.

I. After pullback is completed, the Contractor shall “rest” the product pipeline to allow for any contraction and shrinkage for at least 24 hours. No additional work on the pulled product pipeline shall be allowed during the resting period.

3.07 GUIDANCE SYSTEMS

A. Walkover guidance systems are acceptable for this project. A magnetic survey tool located behind the pilot string cutting head shall also be used for this project.

3.08 DOCUMENTATION

A. The Contractor shall maintain drilling logs that accurately provide drill bit location (both horizontally and vertically) at least every 15 feet along the drill path. In addition, logs shall be kept that record, as a minimum, the following

every 15 minutes throughout each drill pass, back-reaming pass, or product pipe installation pass:

1. Drilling fluid pressure.
2. Drilling fluid flow rate.
3. Drilling fluid temperature.
4. Drill thrust force.
5. Drill pullback force.
6. Drill head torque.

B. Each day, the Contractor shall also record the total amount of drilling mud used and viscosity of the drilling mud. If the viscosity of the drilling mud is changed, the Contractor shall record the new viscosity and the time the mud viscosity was changed.

C. Samples of each log sheet shall be submitted to the Owner/Engineer for approval before work begins.

D. The Engineer shall have access to instrumentation, readings, and logs at all times during operation.

E. After the pull is completed, the Contractor shall provide Record Drawing information of the installed product pipeline. The Record Drawing information shall provide the horizontal and vertical location of the product pipeline tied to the project control datum. At a minimum, the entry and exit locations, angles, and elevations shall be recorded and the locations and depths of the product pipeline shall be recorded at intervals along the entire length of the profile. For profiles under non-submerged surfaces, the interval shall be 10 feet. For profiles under submerged surfaces (such as a lake, stream, canal, or river), the interval shall be 20-foot. This information shall be provided to the Owner/Engineer within 7 calendar days after the completion of each bore path.

3.09 MAINTENANCE OF TRAFFIC

A. During assembly and pullback of the pipe, the pipe must be laid out in such a way to minimize disrupting and interfering with vehicular and pedestrian traffic or other operational conflicts that the Owner/Engineer identify.

B. The Contractor shall be responsible for safe maintenance of pedestrian and vehicular of traffic. If the construction activities require such action a maintenance-of-traffic plan shall be submitted to the Owner/Engineer for approval before work begins. The plan shall be in accordance with Florida Department of Transportation Standard Index 600 Series and Technical Specifications.

3.10 UTILITY LOCATES

A. The Contractor shall locate all utilities before start of excavation or drilling. The Contractor shall be responsible for damage to utilities and shall repair damaged utilities at no cost to the Owner.

3.11 CLEANUP

A. Immediately upon completion of work of this Section, all rubbish and debris shall be removed from the job site. All construction equipment and implements of service shall be removed and the entire area involved shall be left in a neat condition acceptable to the Engineer.

B. "Blow holes" or "breakouts" of drilling fluid to the surface shall be cleaned up immediately and the surface area returned to its original condition. All drilling fluids, spoils, and separated materials shall be disposed of in compliance with federal, state, and local environmental regulations.

C. After the product pipe installation is completed, the Contractor shall restore the pits and drill rig anchors and work areas to their pre-construction or better condition. Seeding shall not be allowed in lieu of sod unless granted in writing by the Owner/Engineer.

END OF SECTION

SECTION 02920
SEEDING AND SODDING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall provide all materials, equipment, labor, and work to construct the project in accordance with the Contract Documents. No time extensions shall be given to the Contractor for not establishing a grass or sod cover during the "proper" planting season.

B. This work includes but is not limited to the following items specified in this Section:

1. Placing sod to provide grass as finished ground cover at all unpaved disturbed areas of the site, including the entire areas of the ponds shall be as indicated on the Contract Drawings.
2. Placing seed to provide grass as finished ground cover in areas (not designated to be sodded) that were disturbed by the work. Provide seed and topsoil for all areas not designated to be sodded that have been disturbed or are indicated on the Contract Drawings to be seeded.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction, latest edition:

1. FDOT Section 570 Performance Turf.
2. FDOT Section 981 Turf Materials.
3. FDOT Section 982 Fertilizer.
4. FDOT Section 983 Water for Grassing.
5. FDOT Section 987 Soil Layer Materials.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. Deliver, store, protect, and handle products to the site to prevent damage from wetness and weather conditions.

C. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

D. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of the manufacturer.

1.06 MAINTENANCE

A. Maintenance shall be as indicated under Part 3, Execution, of this Section.

1.07 DEFINITIONS

A. Weeds: Weeds include but are not limited to Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragqwort, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.08 REGULATORY REQUIREMENTS

A. The Contractor shall comply with regulatory agencies for fertilizer and herbicide composition.

PART 2 PRODUCTS

2.01 GENERAL (NOT USED)

2.02 MATERIALS

A. Topsoil

1. Top soil shall be supplied and installed in accordance with FDOT Standard Section 987.

B. Fertilizer

1. Fertilizer shall be a complete, commercial-grade mixture of 12-8-8 analysis.
2. Fertilizer shall conform to applicable state laws for the material used.
3. Commercial-grade mixture shall conform to FDOT Standards, Section 982.

C. Mulch

1. Mulch shall conform to FDOT Standards, Section 981.
2. Mulch shall be dry grain straw or hay, free of noxious weeds.
3. Mulch shall be thoroughly cured and dried before use.
4. Forest litter, pine needles, or Spanish Moss will not be acceptable.

D. Seed

1. All grass seed shall be the product of a reputable supplier and shall conform to the requirements of the State Department of Agriculture and Consumer Services and all applicable state laws.
2. Grass seed shall conform to FDOT Standards Section 981, with a minimum 80% purity and 80% germination with no noxious weeds.
3. Seed shall be Argentine Bahia applied at a minimum rate of 10 pounds per 1,000 square feet. A thick stand of grass shall be provided.

E. Sod

1. Sod shall conform to FDOT Standards Section 981. A thick stand of grass shall be provided at all locations.
2. Sod shall be Argentine Bahia.
3. Sod planted on private properties shall match the existing sod when practical.

F. Water

1. The water used to produce grass may be obtained from any approved source, in accordance with FDOT Section 983. The water shall be free of excess and harmful chemicals, acids, alkalies, and all substances which may be harmful to plant growth or obnoxious to traffic. Salt or brackish water shall not be used. The Contractor shall make arrangements to secure and pay for water. The Contractor shall make all provisions necessary to water until a thick stand of grass is established.

PART 3 EXECUTION

3.01 SURFACE PREPARATION

A. The entire area to be seeded, as shown on the Drawings or required in this Section, shall be covered with a 6-inch layer of muck or suitable topsoil, carefully spread and disked lightly into the existing soil and finished to the grades indicated.

3.02 FERTILIZING

A. Fertilizer shall be applied uniformly on the surface of the ground at a minimum rate as specified in Section 570 of FDOT Specifications. It shall be mixed into the soil with a disk harrow, where practicable, or by hand-raking in areas of limited accessibility. Mixing shall be continued until the fertilizer is uniformly incorporated into the top 3 inches of soil.

3.03 MULCHING

A. After spreading and mixing the fertilizer, the Contractor shall apply approximately 2 inches, loose thickness, of the mulch material uniformly over the grassing area and cut into the soil to produce a loose mulch thickness of 3 to 4 inches, in accordance with Section 570 of FDOT Specifications. Care shall be exercised to prevent the mulch from being cut too deeply into the soil.

3.04 SEEDING

A. Seed which has become wet or moldy shall not be used. Soon after the mulch material has been cut into the soil and while the soil is still loose and moist, the seed shall be scattered uniformly over the grassing area. Application shall be in conformance with FDOT Standards, Section 570.

3.05 SODDING

A. Application shall be in accordance with FDOT Standards, Section 575.

3.06 WEED CONTROL

A. The Contractor shall apply herbicides as required and as recommended by the County Agricultural Agent. Herbicides shall only be applied as needed.

3.07 COMPACTION

A. Immediately after the seeding is complete, the entire grassed or mulched area shall be compacted with a light roller. Rolling shall be continued until the area is firmly but not tightly packed.

3.08 EQUIPMENT

A. All equipment used in the operation of grassing shall be adequate to produce the required results. Equipment for placing mulch material into the soil shall be suitable for cutting the specified materials uniformly into the soil and to the required controlled depth. Rollers shall have corrugated or notched surfaces and shall be at least 12 inches in diameter. Smooth surface rollers will not be permitted.

3.09 GROUND COVER DATA

A. Planting dates, types of seeds, seed mixtures, and rates of application shall be as set forth in this Section. No changes may be made in the ground cover type without the approval of the Engineer.

3.10 GROUND COVER ESTABLISHMENT

A. General Requirements

1. The Contractor shall provide ground cover (sod and seed) establishment of the specified permanent vegetation before final acceptance of the project with no dead areas of ground cover. Groundcover (sod and seed) establishment shall consist of necessary preserving and protecting to keep the grassed areas in a satisfactory condition. The Contractor shall water the grassed areas as long and as often as necessary to promote maximum practicable growth. At any time, the Engineer may require replanting an area or portion of an area which, for any cause, shows unsatisfactory growth. Except as otherwise specified or permitted by the Engineer, the Contractor shall prepare areas to be replanted in accordance with the

requirements of the Specifications as if such replanting were the initial planting. However, the type of fertilizer and the applicable rate of fertilizer to be furnished and applied by the Contractor as part of plant establishment occasioned by replanting shall be determined by soil tests or otherwise established.

B. Growth and Coverage

1. The Contractor shall be responsible for providing satisfactory growth and coverage as defined below. Growth and coverage shall be considered acceptable when all areas show a satisfactory visible growth with no bare spots larger than 1 square foot. Bare spots shall be scattered, and the total bare areas should not comprise more than 1/100 of any given area.

3.11 EXTENT OF SOD/GRASS MAINTENANCE

A. The Contractor is responsible for all sod and grass maintenance until the date of final completion of the project. Sod and grass maintenance include cutting, watering, fertilizing, re-seeding, and re-sodding as required to maintain the required coverage of healthy, vibrant grass and sod cover.

END OF SECTION

DIVISION 3

CONCRETE

SECTION 03301
CONCRETE AND REINFORCING STEEL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and incidentals required to perform all concrete work as ordered by the Engineer, as shown on the Drawings, and as specified in this Section.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance. Reproductions of contract drawing are unacceptable. Submit full fabrication drawings and technical data on all materials and components. Submit other data specified in this Section when required. Submittals shall include at least the followings:

A. Shop Drawings and Technical Data

1. Joints and joint accessories.
2. Reinforcing steel including bar schedules and bending details.
3. Concrete mix for each formulation of concrete proposed for use, including constituent quantities per cubic yard, water cementitious ratio, type, and manufacturer of cement.
4. Formwork and accessories.
5. Grout.
6. Each type of mechanical reinforcing steel connector.

B. Samples

1. Two samples of each type of mechanical reinforcing steel connection.

C. Test Reports

1. Sieve analysis of fine and coarse aggregates.

2. Concrete mix for each formulation of concrete proposed for use, including constituent quantities per cubic yard, water cementitious ratio, type and manufacturer of cement, and either a. or b. below:

a. Standard deviation data for each proposed concrete mix based on statistical records.

b. Water cementitious ratio curve for each proposed concrete mix based on laboratory tests. Give average cylinder strength test results at 28 days for laboratory concrete mix designs. Provide results of 7- and 14-day tests if available.

3. Concrete compressive strength, air content, and slump tests.

D. Certifications

1. Certify that admixtures used in the same concrete mix are compatible with each other and the aggregates.
2. Material Safety Data Sheet (MSDS).
3. Curing concrete elements.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Concrete Institute (ACI)

1. ACI 117—Specification for Tolerances for Concrete Construction and Materials and Commentary.
2. ACI 211.1—Standard Practice for Selecting proportions for Normal, Heavyweight, and Mass Concrete.
3. ACI 301—Specifications for Structural Concrete.
4. ACI 305R—Guide to Hot Weather Concreting.
5. ACI 306R—Guide to Cold Weather Concreting.
6. ACI 306.1—Standard Specification for Cold Weather Concreting.
7. ACI 315—Details and Detailing of Concrete Reinforcement.
8. ACI 318—Building Code Requirements for Structural Concrete and Commentary.
9. ACI 347R—Guide to Formwork for Concrete.
10. ACI 350R—Environmental Engineering Concrete Structures.
11. ACI MCP-4—Manual of Concrete Practice – Volume 4.

B. American Society for Testing and Materials (ASTM)

1. ASTM A615/A615M—Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
2. ASTM A1064/A1064M—Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

3. ASTM C31/C31M—Standard Practice for Making and Curing Concrete Test Specimens in the Field.
4. ASTM C33/C33M—Standard Specification for Concrete Aggregates.
5. ASTM C94/C94M—Standard Specification for Ready-Mixed Concrete.
6. ASTM C143/C143M—Standard Test Method for Slump of Hydraulic-Cement Concrete.
7. ASTM C150/C150M—Standard Specification for Portland Cement.
8. ASTM C171—Standard Specification for Sheet Materials for Curing Concrete.
9. ASTM C173/C174M—Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
10. ASTM C231/C231M—Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
11. ASTM C260/C260M—Standard Specification for Air-Entraining Admixtures for Concrete.
12. ASTM C309—Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
13. ASTM C494/C494M—Standard Specification for Chemical Admixtures for Concrete.
14. ASTM C618—Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
15. ASTM C827/C827M—Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures.
16. ASTM C881/C881M—Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
17. ASTM C920—Standard Specification for Elastomeric Joint Sealants.
18. ASTM C932—Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering.
19. ASTM C990—Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.
20. ASTM C1107/C1107M—Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
21. ASTM C1116/C1116M—Standard Specification for Fiber-Reinforced Concrete.
22. ASTM D1751—Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
23. ASTM D1752—Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
24. ASTM D2103—Standard Specification for Polyethylene Film and Sheeting.

25. ASTM D4397—Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
26. ASTM D6690—Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

C. Concrete Reinforcing Steel Institute (CRSI)

1. MSP—Manual of Standard Practice.

1.04 QUALITY ASSURANCE

A. Reinforced concrete shall comply with ACI 318; the recommendations of ACI 350R; and other stated requirements, codes, and standards. The most stringent requirement of the codes, standards, and this Section shall apply when conflicts exist.

B. Only one source of cement and aggregates shall be used on any one structure. Concrete shall be uniform in color and appearance.

C. Thirty days in advance of placing concrete, the Contractor shall discuss with the Engineer the sources of individual materials and batched concrete proposed for use. Discuss placement methods, waterstops, and curing. Propose methods of hot and cold weather concreting as required. Before placing any concrete containing a high-range water-reducing admixture (plasticizer), the Contractor, accompanied by the plasticizer manufacturer, shall discuss with the Engineer the properties and techniques of batching and placing plasticized concrete.

D. A firm providing field testing and inspection services will be approved by the Owner. The cost of such work, except as specifically stated otherwise, shall be paid by the Contractor and reimbursed by the Owner under the Concrete Testing Allowance. The following items shall be tested by the Owner to verify conformity with this Section:

1. Concrete placements—compressive strength (cylinders), compressive strength (cores), slump, and air content.
2. Other materials or products that may come under question.
3. All materials incorporated in the work shall conform to accepted samples.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

B. Furnish the Owner with a written warranty that the mechanical splice system is free from manufacturing defects and will perform as represented.

PART 2 PRODUCTS

2.01 GENERAL

A. The use of the manufacturer's name and model or catalog number is to establish the standard of quality and general configuration desired.

B. Like items of materials shall be the end products of one manufacturer to provide standardization of appearance, maintenance, and manufacturer's service.

C. Materials shall comply with this Section and any applicable State or local requirements.

2.02 MATERIALS

A. Cement: Domestic Portland cement complying with ASTM C150/C150M. Air entraining cements shall not be used. The brand of cement shall be subject to approval by the Engineer and one brand shall be used throughout the Work. The following cement type(s) shall be used:

1. Class A, B, C, D Concrete Type II with the addition of fly ash resulting in C3A being below 5% of total cementitious content, Type III limited to 5% C3A, or Type V.

B. Aggregate: Washed inert natural sand conforming to the requirements of ASTM C33/C33M.

C. Water: Potable water free from injurious amounts of oils, acids, alkalis, salts, organic matter, or other deleterious substances.

D. Admixtures: Admixtures shall be free of chlorides and alkalis (except for those attributable to water). When more than one admixture is required to be used in a concrete mix, the admixtures shall be from the same manufacturer. Admixtures shall be compatible with the concrete mix, including other admixtures, and shall be suitable for use in contact with potable water after 30 days of concrete curing.

1. Air-Entraining Admixture—The admixture shall comply with ASTM C260/C260M.
2. Water-Reducing Agent—The admixture shall comply with ASTM C494/C494M, Type A.

3. High-Range Water-Reducer (Plasticizer)—The admixture shall comply with ASTM C494/C494M, Type F and shall result in non-segregating plasticized concrete with little bleeding and with the physical properties of low water/cement ratio concrete. The treated concrete shall be capable of maintaining its plastic state more than 2 hours.
4. Admixtures causing retarded or accelerated setting of concrete shall not be used without written approval from the Engineer. When allowed, the admixtures shall be retarding or accelerating water-reducing or high-range water-reducing admixtures.

E. Pozzolan (Fly Ash) shall be Class F fly ash complying with ASTM C618, except that the Loss on Ignition (LOI) shall be limited to 3% maximum.

F. Materials for Curing Concrete

1. Sheet Curing Materials—Waterproof paper, polyethylene film, or white burlap polyethylene sheeting shall comply with ASTM C171.
2. Liquid Curing Compound—Liquid membrane forming curing compound shall comply with the requirements of ASTM C309, Type 1 D (clear or translucent with fugitive dye) and shall contain no wax, paraffin, or oil. The curing compound shall be approved for use in contact with potable water after 30 days according to NSF 61 (non-toxic and free of taste or odor).

G. Chemical hardener shall be Lapidolith by Sonneborn, Hornolith by A.C. Horn, Penalith by W.R. Meadows, or equal fluosilicate base material.

H. Concrete sealer shall be "Kure N Seal," by Sonneborn, Minneapolis, MN, or equal.

2.03 MIXES

A. Select proportions of ingredients to meet the design strength and materials limits specified in Table 1 and to produce concrete having proper workability, durability, strength, appearance, and other required properties. Proportion ingredients to produce a homogenous mixture, which will readily work into corners and angles of forms and around reinforcement without permitting materials to segregate or allowing excessive free water to collect on the surface.

B. The design mix shall be based on standard deviation data of prior mixes with essentially the same proportions of the same constituents or, if such data are not available, be developed by a testing laboratory acceptable to the Engineer and engaged by and at the expense of the Contractor. Mixes based on standard deviation shall be accepted based on the modification factors for standard

deviation tests contained in ACI 318. The water content of the concrete mix, determined by laboratory testing, shall be based on a curve showing the relation between water cementitious ratio and 7- and 28-day compressive strengths of concrete made using the proposed materials. The curves shall be determined by four or more points, each representing an average value of at least three test specimens at each age. The curves shall have a range of values sufficient to yield the desired data, including the specified design strengths as modified below, without extrapolation. The water content of the concrete mixes to be used, as determined from the curve, shall correspond to strengths 16% greater than the specified design strengths. The resulting mix shall not conflict with the limiting values for maximum water cementitious ratio and net minimum cementitious content as specified in Table 1.

C. Entrained air, as measured by ASTM C231/C231M, shall be as shown in Table 1.

1. If the air-entraining agent proposed for use in the mix requires testing methods other than those in ASTM C231/C231M to accurately determine air content, make special note of this requirement in the admixture submittal.

D. Slump of the concrete as measured by ASTM C143/C143M shall be as shown in Table 1. If a high-range water-reducer (plasticizer) is used, the slump indicated shall be that measured before plasticizer is added. Plasticized concrete shall have a slump ranging from 7 to 10 inches.

TABLE 1
CONCRETE MIX REQUIREMENTS

Class	Design Strength (1)	Cement (2)	Fine Aggregate (2)	Coarse Aggregate (3)	Cementitious Content (4)
A	2500	C150 Type II	C33	57	440 min.
B	3000	C150 Type II	C33	57	480 min.
C	4000	C150 Type II	C33	57	560 min.
D	5000	C150 Type II	C33	57	600 min.

Class	W/C Ratio (5)	Fly Ash	AE Range (6)	WR (7)	HRWR (8)	Slump Range (Inches)
A	0.60 max.	--	3.5 to 5	Yes	*	1-4
B	0.54 max.	--	2.5 to 5	Yes	*	1-3
C	0.44 max.	20 – 25%	2.5 to 5	Yes	*	3-5
D	0.40 max.	--	3.5 to 5	Yes	*	3-5

NOTES:
(1) Minimum compressive strength in psi at 28 days.
(2) ASTM designation.
(3) Size Number in ASTM C33/C33M.
(4) Cementitious content in pounds/cubic yard.
(5) W/C is Water-Cementitious ratio by weight.
(6) AE is percent air-entrainment.
(7) WR is water-reducer admixture.
(8) HRWR is high-range water-reducer admixture.
* HRWR used at the Contractor's option.

2.04 CONCRETE REINFORCEMENT

A. Reinforcing steel shall be deformed bars and shall comply with ASTM A615/A615M, Grade 60.

B. Welded wire fabric shall be flat sheet and comply with ASTM A1064/A1064M.

C. Fiber reinforcement shall be synthetic fibers with 100% polypropylene collated, fibrillated fibers and with a minimum tensile strength of 70 ksi. Fiber-reinforced concrete shall be in accordance with ASTM C1116/C1116M, Type III, Synthetic Fiber-Reinforced Concrete. Use a minimum of 1.5 pounds of fibers per cubic yard of concrete. Add fibers at the batch plant.

2.05 FORMS

A. Forms for cast-in-place concrete shall be made of wood, metal, or other approved material. All forms shall be designed and constructed to provide a flat, uniform concrete surface requiring minimal finish or repairs.

B. Forms shall be free from roughness and imperfections, substantially watertight, and adequately braced and tied to prevent motion when concrete is placed. No wooden spreaders will be allowed in the concrete.

C. The form-release agent shall be coated on all surfaces in contact with concrete using effective, non-staining, non-residual, water-based, bond-breaking form coatings.

D. Wire ties will not be allowed. Metal ties or anchorages necessary within the forms shall be so constructed that the metal work can be removed for a depth of at least

1 inch from the surface of the concrete without injury to such surface by spalling or otherwise. Forms shall be thoroughly cleaned before using and shall be treated with oil or other approved material.

E. All exposed edges of the finished concrete shall be chamfered 3/4 inch.

2.06 EXPANSION/CONTRACTION JOINTS

A. Pre-molded joint fillers for water holding structures shall be non-extruding and resilient non-bituminous type and comply with ASTM D1752, Type III. Joint fillers for sidewalk and roadway pavements shall be asphalt-impregnated fiber board conforming to ASTM D1751.

B. Joint sealants shall comply with ASTM D6690, Type M class 25 for horizontal surface, and ASTM C920, Type M grade NS class 25 for vertical surface greater than 3% slope.

C. Bond breaker shall be an adhesive-backed glazed butyl or polyethylene tape.

2.07 WATERSTOPS (NOT USED)

2.08 BONDING MATERIALS

A. The concrete bonding agent shall be an aqueous-phase, film-forming, non-oxidizing, freeze- and thaw-resistant compound agent suitable for brush or spray application conforming to ASTM C932.

B. Epoxy adhesive binder shall be two-component, epoxy-polysulfide polymer-type bind with amine-type curing agent conforming to ASTM C881/C881M, Type II.

2.09 VAPOR BARRIER

A. Vapor barrier shall be clear polyethylene sheeting, 6-mil conforming to ASTM D2103 or D4397.

2.10 GROUT

A. Non-shrink, cementitious grout shall comply with ASTM C1107/C1107M, Grade B or C.

B. Non-shrink, epoxy machinery grout shall conform to ASTM C827/C827M with compressive strength of 12,000 psi in 7 days.

C. Concrete grout shall have a compressive average strength of 3,000 psi at 29 days. Synthetic fiber reinforcing fibers shall be added to the grout mix at rate of 1.5 pounds of fiber per cubic yard of grout.

PART 3 EXECUTION

3.01 REINFORCING STEEL

A. Reinforcement shall be accurately fabricated to the dimensions shown. Bars shall be bent around a pin having a diameter not less than that recommended in ACI 318. All bars shall be bent cold.

B. Reinforcement shall be shipped to the work with bars of the same size and shape fastened in bundles with metal identification tags giving size and mark securely wired on. The identification tags shall be labeled with the same designation as shown on submitted bar schedules and shop drawings.

C. All bars shall be stored off the ground and shall be protected from moisture and be kept free from dirt, oil, or injurious coatings. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

D. Tension lap splices shall be provided at all laps in compliance with ACI 318. All bar splices shall be staggered wherever possible. When splicing bars of different diameters, the length of lap is based on the larger bar. Class B splices shall be used at all locations unless otherwise indicated on the Drawings.

E. Before being placed in position, reinforcement shall be thoroughly cleaned of loose mill and rust scale, dirt, and other coatings that reduce or destroy bond. Where there is delay in depositing concrete after reinforcement is in place, bars shall be reinspected and cleaned when necessary.

F. Reinforcement that is to be exposed for a considerable length of time after being placed shall be painted with a heavy coat of cement grout, if required.

G. In no case shall any reinforcing steel be covered with concrete until the number and position of the reinforcements have been checked by the Engineer and his/her permission given to proceed with the concreting.

3.02 MECHANICAL COUPLER SYSTEM

A. Use mechanical reinforcing steel coupling system only where indicated. Install in accordance with the manufacturer's written instructions and as specified in this Section.

B. Upon receiving the coupler system, obtain the threaded length for the male ends and sample each lot for variation in thread length on male ends. Record the amount of actual thread (per lot).

C. After formwork is removed, confirm cap is in position (female end).

D. Before installing the male end, remove screwed cap and confirm that the female end (coupler) is clean and free of concrete splatter, dirt, burrs, or other matter which may foul threads.

E. Tighten the dowel bar male end until the threads are fully engaged and no threads are exposed. Do not strip threads.

F. Visually inspect all splice locations. A correctly installed splice will show no exposed threads on the threaded splice bars.

3.03 CONCRETE MIXING AND TRANSPORTING

A. Concrete shall be ready-mixed concrete produced by equipment acceptable to the Engineer. No hand mixing will be permitted. Clean each transit mix truck drum and reverse drum rotation before the truck proceeds under the batching plant. Equip each transit mix truck with a continuous, nonreversible, revolution counter showing the number of revolutions at mixing speeds.

B. Ready mix concrete shall be transported to the site in watertight agitator or mixer trucks loaded not in excess of their rated capacities as stated on the name plate.

C. Keep the water tank valve on each transit truck locked at all times. Any addition of water must be directed by the Engineer. Added water shall be incorporated by additional mixing of at least 35 revolutions. All added water shall be metered and the amount of water added shall be shown on each delivery ticket.

D. All central plant and rolling stock equipment and methods shall comply with ACI 318 and ASTM C94/C94M.

E. Select equipment of size and design to ensure continuous flow of concrete at the delivery end. Metal or metal-lined non-aluminum discharge chutes shall be used and shall have slopes not more than 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 feet long and chutes not meeting slope requirements may be used if concrete is discharged into a hopper before distribution.

F. Re-tempering (mixing with or without additional cement, aggregate, or water) of concrete or mortar which has reached initial set will not be permitted.

G. Handle concrete from mixer to placement as quickly as practicable while providing concrete of required quality in the placement area. Dispatch trucks from the batching plant so they arrive at the work site just before the concrete is required, thus avoiding excessive mixing of concrete while waiting or delays in placing successive layers of concrete in the forms.

H. Furnish a delivery ticket for ready-mixed concrete to the Engineer as each truck arrives. Each ticket shall provide a printed record of the weight of cement and each aggregate as batched individually. Use the type of indicator that returns for zero punch or returns to zero after a batch is discharged. Clearly indicate the weight of fine and coarse aggregate, cement, and water in each batch; the quantity delivered; the time any water is added; and the numerical sequence of the delivery. Show the time of day batched and time of discharge from the truck. Indicate the number of revolutions of the truck mixer.

I. Temperature and Mixing Time Control

1. In cold weather, do not allow the as-mixed temperature of the concrete and concrete temperatures at the time of placement in the forms to drop below 40°F.

2. If the water or aggregate has been heated, combine the water with aggregate in the mixer before cement is added. Do not add cement to mixtures of water and aggregate when the temperature of the mixture is greater than 90°F.

3. In hot weather, cool ingredients before mixing to maintain temperature of the concrete below the maximum placing temperature of 90°F. If necessary, substitute well-crushed ice for all or part of the mixing water.

4. The maximum time interval between adding mixing water and/or cement to the batch and placing concrete in the forms shall not exceed the values shown in Table 2.

TABLE 2
MAXIMUM TIME TO DISCHARGE OF CONCRETE

Air or Concrete Temperature (whichever is higher)	Maximum Time
80 to 90°F (27 to 32°C)	45 minutes
70 to 79°F (21 to 26°C)	60 minutes
40 to 69°F (5 to 20°C)	90 minutes

J. If an approved high-range water-reducer (plasticizer) is used to produce plasticized concrete, the maximum time interval shall not exceed 90 minutes.

3.04 CONCRETE APPEARANCE

A. Concrete mix showing either poor cohesion or poor coating of the coarse aggregate with paste shall be remixed. If this does not correct the condition, the concrete shall be rejected.

B. Concrete for the work shall provide a homogeneous structure which, when hardened, will have the required strength, durability, and appearance. Mixtures and workmanship shall be such that concrete surfaces, when exposed, will require no finishing. When concrete surfaces are stripped, the concrete when viewed in good lighting from 10 feet away shall be pleasing in appearance and at 20 feet shall show no visible defects.

3.05 PLACING CONCRETE

A. Reinforcement, where required, shall be accurately placed in the exact positions shown, shall be secured against displacement with annealed iron wire ties or suitable clips at intersections, and shall have a clear space of 2 inches between the steel and face of forms unless otherwise indicated. Wire ties passing through the forms to hold the steel in proper position will not be allowed. Concrete blocks with wire ties cast in them may be used where approved by the Engineer to maintain the clearance between reinforcement and forms. Reinforcing bars shall be free from rust, scale, dirt, grease, and injurious contaminants.

B. No concrete shall be placed until the Engineer has approved forms and method of placement. Before concrete is deposited, all debris, foreign matter, dirt, and water shall be removed from the forms. The surface of concrete previously placed, such as manhole bases or horizontal construction joints, shall be cleaned and brushed with cement paste. Concrete shall not be placed in water or submerged within 24 hours after placing, nor shall running water be permitted to flow over the surface of fresh concrete within 4 days after its placing.

C. Deposit concrete as near its final position as possible to avoid segregation due to rehandling or flowing. Pumping of concrete will be permitted when an approved design mix and aggregate sizes, suitable for pumping, are used. Do not deposit concrete that has partially hardened or has been contaminated by foreign materials. If the section cannot be placed continuously, place construction joints as specified or as approved. Place concrete for walls using tremie tubes in 12- to 24-inch lifts, keeping the surface horizontal. Do not drop concrete more than 4 feet.

D. High-frequency mechanical vibrators shall be used to the extent necessary to obtain proper consolidation of the concrete. Care shall be taken to avoid segregating aggregates by excessive vibration. Concrete adjacent to forms and around pipe stubs shall be carefully spaded or rodded.

E. Concrete walls shall be deposited in one continuous operation with concrete brought up evenly on all sides. Chutes shall be of metal, "U" shaped, and provided with a baffle plate at the end, if necessary, to prevent segregation of materials. Chutes shall be placed at an angle of not less than 25 degrees, nor more than 45 degrees from horizontal and they shall be kept clean and free from hardened concrete.

F. No concrete shall be mixed or placed during freezing weather without explicit permission. When placing concrete when the air temperature is below 40ºF, heat the water, sand, and gravel so that the temperature of the concrete will be at least 50ºF. This temperature shall be maintained for 72 hours after placing.

3.06 FIELD TESTS

A. The Engineer will take sets of three field control cylinder specimens during the progress of the work, in compliance with ASTM C31/C31M. The number of sets of concrete test cylinders taken of each class of concrete placed each day shall not be fewer than one set nor fewer than one set for each 150 cubic yards of concrete nor fewer than one set for each 5,000 square feet of surface area for slabs or walls. One cylinder shall be broken at 7 days and two cylinders shall be broken and their strengths averaged at 28 days. When the average 28-day compressive strength of the cylinders in any set falls below the specified compressive strength or below proportional minimum 7-day strengths (where the proper relation between 7- and 28-day strengths has been established by tests), the Engineer may reject the concrete represented by the set of cylinders and may require modification of the concrete and/or require modification of the proportions, water content, or temperature conditions of the design mix to achieve the required strengths.

B. The Contractor shall cooperate in testing by allowing free access to the work for selecting samples, providing an insulated closed curing box for specimens, protecting the specimens against injury or loss through his/her operations, and furnishing material and labor required for taking concrete cylinder samples. All shipping of specimens will be paid for by the Owner.

C. Slump tests will be made in the field by the Engineer in conformity with ASTM C143/C143M.

D. Tests for air content shall be made in compliance with either the pressure method complying with ASTM C231/C231M or by the volumetric method complying with ASTM C173/C173M.

3.07 FORMED SURFACES

A. Forms shall remain in-place for the time specified in ACI MCP-4. Do not remove forms and shores until the concrete has gained sufficient strength to support its weight and superimposed loads.

B. Exercise care to prevent damaging edges or obliterating the lines of chamfers, rustications, or corners when removing the forms or performing any other work adjacent to such chamfers, rustications, or corners.

C. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete.

D. Rough Form Finish

1. Immediately after stripping forms and before the concrete has changed color, carefully remove all fins and projections.
2. Promptly fill holes left by tie cones and defects as specified.

3.08 FLOORS AND SLABS

A. Floated Finish

1. Machine Floating:

a. Screed slabs with straightedges to the established grades shown on the Drawings. Immediately after final screeding sprinkle a dry cement/sand shake in the proportion of two sacks of Portland cement to 350 pounds of coarse natural concrete sand evenly over the surface at the rate of approximately 500 pounds/1,000 square foot of slab. Do not sprinkle neat, dry cement on the surface.

b. The application of the cement/sand shake may be eliminated at the discretion of the Engineer if the base slab concrete exhibits adequate fattiness and homogeneity and the need is not indicated. When the concrete has hardened sufficiently to support the weight of a power float without the float's digging into or disrupting the level surface, thoroughly float the shake into the surface with a heavy revolving disc-type power compacting machine capable of providing a 200-pound compaction force distributed over a 24-inch-diameter disc.

c. Start floating along walls and around columns and then move systematically across the surface leaving a matte finish.

d. The compacting machine shall be the "Kelly Power Float with Compaction Control" as manufactured by Kelley Industries of SSP Construction Equipment Inc., Pomona, CA or equal. Troweling machines equipped with float (shoe) blades that are slipped over the trowel blades may be used for floating. Floating with a troweling machine equipped with normal trowel blades will not be permitted. The use of any floating or troweling machine which has a water attachment for wetting the concrete surface during finishing will not be permitted.

2. Hand Floating:

a. In lieu of power floating, small areas may be compacted by hand floating. The dry cement/sand shake previously specified shall be used unless specifically eliminated by the Engineer. Screed the slabs with straightedges to the established grades shown on the Drawings. While the concrete is still green but sufficiently hardened to support a finisher and kneeboards with no more than 1/4-inch indentation, wood float to a true, even plane with no coarse aggregate visible. Use sufficient pressure on the wood floats to bring moisture to the surface.

3. Finishing Tolerances:

a. Level slabs to a tolerance of plus or minus 1/8 inch when checked with a 10-foot straightedge placed anywhere on the slab in any direction. Failure to meet the above requirements shall be cause for removal, grinding, or other correction as directed by the Engineer.

B. Broom Finish

1. Screed slabs with straightedges to the established grades indicated on the Drawings. When the concrete has stiffened sufficiently to maintain small surface indentations, draw a stiff bristle broom lightly across the surface in the direction of drainage or, in the case of walks and stairs, perpendicular to the direction of traffic to provide a non-slip surface.

C. Steel Trowel Finish

1. Finish concrete as specified in Article 3.04. Then, hand steel trowel to a perfectly smooth, hard, even finish free from high or low spots or other defects.

D. Concrete Sealer

1. Prepare and seal surfaces indicated on the room finish schedule to receive a sealer as follows:

a. Finish concrete as specified in the preceding paragraphs and in accordance with the Schedule in Article 3.13.
b. Newly Placed Concrete: Surface must be sound and properly finished. Surface is application ready when it is damp but not wet and can no longer be marred by walking workmen.
c. Newly Cured Bare Concrete: Level any spots gouged out by trades. Remove all dirt, dust, droppage, oil, grease, asphalt, and foreign matter. Cleanse with caustics and detergents as required. Rinse thoroughly and allow to dry so that surface is no more than damp and not wet.
d. Aged Concrete: Restore surface soundness by patching, grouting, filling cracks and holes, etc. Surface must also be free of any dust, dirt, and other foreign matter. Use power tools and/or strippers to remove any incompatible sealers or coatings. Cleanse as required following the procedure indicated under cured concrete.
e. Methods: Apply sealer to form a continuous, uniform film by spray, soft bristle pushbroom, long nap roller, or lambswool applicator. Ordinary garden type sprayers, using neoprene hose, are recommended for best results.
f. Applications: For curing only, apply the first coat evenly and uniformly as soon as possible after final finishing at the rate of 200 to 400 square feet per gallon. Apply the second coat when all trades are completed and the structure is ready for occupancy at the rate of 400 to 600 square feet per gallon.
g. To meet guarantee and to seal and dustproof, two coats are required. For sealing new concrete, both coats shall be applied full strength. On aged concrete, when renovating, dustproofing, and sealing, the first coat should be thinned 10 to 15% with reducer in accordance with the manufacturer's directions.

3.09 CONCRETE RECEIVING CHEMICAL HARDENER (NOT USED)

3.10 APPROVAL OF FINISHES

A. All concrete surfaces, when finished, will be examined by the Engineer.

B. Surfaces which in the opinion of the Engineer are unsatisfactory shall be refinished or reworked.

C. After finishing horizontal surfaces, regardless of the finishing procedure specified, the concrete shall be cured in compliance with this Section unless otherwise directed by the Engineer.

1. Interior or Exterior Horizontal Concrete not Requiring Floor Hardener or Sealer: Floated finish. See Paragraph 3.08D.
2. Concrete for Exterior Walks and Interior and Exterior Stairs: Broomed finish perpendicular to direction of traffic. See Paragraph 3.08B.
3. Concrete Slabs On Which Process Liquids Flow or In Contact with Sludge: Steel trowel finish. See Paragraph 3.08C.

3.11 CURING AND PROTECTION

A. The Contractor shall protect all concrete work against injury from the elements and defacements of any nature during construction operations.

B. Curing Methods

1. Curing Methods for Concrete Surfaces: Cure concrete to retain moisture and maintain specified temperature at the surface for a minimum of 7 days after placement. Curing methods to be used are as follows:

a. Water Curing: Keep entire concrete surface wet by ponding, continuous sprinkling, or by covering with saturated burlap. Begin wet cure as soon as concrete attains an initial set and maintain wet cure 24 hours a day.
b. Sheet Material Curing: Cover entire surface with sheet material. Securely anchor sheeting to prevent wind and air from lifting the sheeting or entrapping air under the sheet. Place and secure sheet as soon as initial concrete set occurs.
c. Liquid Membrane Curing: Apply over the entire concrete surface except for surfaces to receive additional concrete. DO NOT place curing compound on any concrete surface where additional concrete is to be placed or where concrete sealers or surface coatings are to be used. Apply curing compound as soon as the free water on the surface has disappeared and no water sheen is visible, but not after the concrete is dry or when the curing compound can be absorbed into the concrete. Application shall be in compliance with the manufacturer's recommendations.

C. Finished surfaces and slabs shall be protected from the direct rays of the sun to prevent checking and crazing.

D. Cold Weather Concreting

1. *Cold weather* is defined as a period when the average daily outdoor temperature drops below 40°F for more than 3 successive days. The average daily temperature shall be calculated as the average of the highest and the lowest temperature during the period from midnight to midnight.

2. Cold weather concreting shall conform to ACI 306.1 and the additional requirements specified in this Section. Temperatures at the concrete placement shall be recorded at 12-hour intervals (minimum).

3. The Contractor shall discuss a cold weather work plan with the Engineer. The discussion shall encompass the methods and procedures proposed for use during cold weather, including the production, transportation, placement, protection, curing, and temperature monitoring of the concrete. The procedures to be implemented upon abrupt changes in weather conditions or equipment failures shall also be discussed. Cold weather concreting shall not begin until the work plan is acceptable to the Engineer.

4. During periods of cold weather, concrete shall be protected to provide continuous warm, moist curing (with supplementary heat when required) for a total of at least 350 degree-days of curing.

    a. *Degree-days* are defined as the total number of 24-hour periods multiplied by the weighted average daily air temperature at the surface of the concrete (e.g., 5 days at an average of 70°F = 350 degree-days).
    b. To calculate the weighted average daily air temperature, sum hourly measurements of the air temperature in the shade at the surface of the concrete taking any measurement less than 50°F as 0°F. Divide the sum thus calculated by 24 to obtain the weighted average temperature for that day.

5. Salt, manure, or other chemicals shall not be used for protection.

6. The protection period for concrete being water cured shall not be terminated during cold weather until at least 24 hours after water curing has been terminated.

E. Hot Weather Concreting

1. *Hot weather* is defined as any combination of high air temperatures, low relative humidity, and wind velocity which produces a rate of evaporation

estimated in accordance with ACI 305R, approaching or exceeding 0.2 pound/square foot/hour).

2. Concrete placed during hot weather shall be batched, delivered, placed, cured, and protected in compliance with the recommendations of ACI 305R and the additional requirements specified in this Section.

    a. Temperature of concrete being placed shall not exceed 90°F and every effort shall be made to maintain a uniform concrete mix temperature below this level. The temperature of the concrete shall be such that it will cause no difficulties from loss of slump, flash set, or cold joints.
    b. All necessary precautions shall be taken to deliver the concrete promptly, to place the concrete promptly upon its arrival at the job, and to provide vibration immediately after placement.
    c. The Engineer may direct the Contractor to immediately cover plastic concrete with sheet material.

3. The Contractor shall discuss with the Engineer a work plan describing the methods and procedures proposed to use for concrete placement and curing during hot weather. Hot weather concreting shall not begin until the work plan is acceptable to the Engineer.

3.12 STRIPPING AND FINISHING CONCRETE

A. Forms shall not be stripped before the concrete has attained a strength of at least 30% of the specified design strength, unless otherwise approved by the Engineer. This is equivalent to approximately "100 day-degrees" of moist curing.

B. Shores shall not be removed until the concrete has attained at least 70% of its specified design strength and also sufficient strength to support safely its own weight and construction live loads.

C. Care shall be exercised to prevent damaging edges or obliterating the lines of chamfers, rustications, or corners when removing the forms or doing any other adjacent work.

D. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete to the satisfaction of the Engineer.

E. As soon as forms have been stripped, remove form ties, if employed, and fill the recess to ensure complete watertightness. Chip out and repair any defects in the surface of the walls in a workmanlike manner. Defective concrete where it occurs shall be cut to a minimum depth of 1 inch, thoroughly roughened, and neat

cement brushed in. The hole shall then be filled with mortar in the proportion of 1 part cement and 2-1/2 parts sand with a minimum of water. Mortar for filling form tie recesses shall be mixed to a slightly damp consistency (just short of "balling"), pressed into the recess until dense, and troweled smooth. Mortar in larger patches shall be applied and allowed to assume a partial set following which it shall be struck off flush with the adjoining surface. Patches shall be kept moist for several days to ensure proper curing.

F. Top surface of slabs shall be screeded to the established grades and shall be a true plane with a tolerance of 1/8 inch when checked with a 10-foot straightedge. The surface shall be finished to give a smooth, hard, even surface free from high or low spots or other defects. Failure to meet the condition shall be cause for removal, grinding, or other correction as directed by the Engineer.

G. Concrete to receive Liner System shall be finished in strict accordance with the manufacturer's recommendations.

3.13 SCHEDULE

A. The following (Table 3) are the general applications for the various concrete classes and design strengths:

TABLE 3
CONCRETE SCHEDULE

Class	Design Strength (psi)	Description
A	2,500	Concrete fill and duct encasement.
B	3,000	Concrete overlay slabs and curbs/pavements.
C	4,000	Slabs on grade, precast lids, and all other structural concrete.
D	5,000	Prestressed concrete.

3.14 MISCELLANEOUS WORK

A. Sleeve steel work required to be set in the concrete forms for attachment of structural and miscellaneous equipment shall be set or installed under this Division. The Contractor shall be fully responsible for the setting of such materials in the forms and shall correct all such materials not installed in a proper location or manner at his own expense.

END OF SECTION

DIVISION 5

METALS

SECTION 05500
METAL FABRICATIONS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes the following:

1. Metal ladders.
2. Ladder safety cages.
3. Metal bollards.
4. Loose bearing and leveling plates.
5. Shelf and relieving angles.
6. Miscellaneous framing and supports.
7. Prefabricated steel building columns.
8. Steel channels for overhead door openings.
9. Stair nosings.
10. Loose steel lintels.
11. Gratings.
12. Access hatches.

B. Products furnished, but not installed, under this Section include the following:

1. Anchor bolts, steel pipe sleeves, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product Data: For the following:

1. Non-slip aggregates and non-slip-aggregate surface finishes.
2. Prefabricated building columns.
3. Metal nosings and treads.
4. Paint products.
5. Grout.

B. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
2. Provide templates for anchors and bolts specified for installation under other Sections.
3. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Verification: For each type and finish of extruded nosing.

D. Mill Certificates: Signed by the manufacturers of stainless-steel sheet certifying that products furnished comply with requirements.

E. Welding certificates.

F. Qualification Data: Florida Professional Engineering Registration certificate.

1.03 WORK SEQUENCE

A. The Contractor shall coordinate the installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to the Project site in time for installation.

B. The Contractor shall coordinate the installation of steel weld plates and angles for casting into concrete that are specified in this Section but required for work of another Section. Deliver such items to the Project site in time for installation.

1.04 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American National Standards Institute (ANSI)

1. ANSI A14.3—Ladders – Fixed – Safety Requirements.

B. American Society for Testing and Materials (ASTM)

1. ASTM A27/A27M—Standard Specification for Steel Castings, Carbon, for General Application.
2. ASTM A36/A36M—Standard Specification for Carbon Structural Steel.
3. ASTM A47/A47M—Standard Specification for Ferritic Malleable Iron Castings.
4. ASTM A48/A48M—Standard Specification for Gray Iron Castings.
5. ASTM A53/A53M—Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
6. ASTM A123/A123M—Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
7. ASTM A153/A153M—Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
8. ASTM A276/A276M—Standard Specification for Stainless Steel Bars and Shapes.
9. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
10. ASTM A489—Standard Specification for Carbon Steel Lifting Eyes.
11. ASTM A500/A500M—Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
12. ASTM A563—Standard Specification for Carbon and Alloy Steel Nuts.
13. ASTM A653/A653M—Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
14. ASTM A666—Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
15. ASTM A780/A780M—Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
16. ASTM A786/A786M—Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
17. ASTM B108/B108M—Standard Specification for Aluminum-Alloy Permanent Mold Castings.
18. ASTM B209—Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
19. ASTM B221—Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
20. ASTM B241/B241M—Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
21. ASTM B633—Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
22. ASTM C1107/C1107M—Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

23. ASTM D1187/D1187M—Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
24. ASTM E488/E488M—Standard Test Methods for Strength of Anchors in Concrete Elements.
25. ASTM F436/F436M—Standard Specification for Hardened Steel Washers.
26. ASTM F593—Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
27. ASTM F594—Standard Specification for Stainless Steel Nuts.
28. ASTM F836M—Standard Specification for Style 1 Stainless Steel Metric Nuts (Metric).
29. ASTM F879—Standard Specification for Stainless Steel Socket Button and Flat Countersunk Head Cap Screws.
30. ASTM F1554—Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
31. ASTM F3125/F3125M—Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1,040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.

C. American Society of Mechanical Engineers (ASME)

1. ASME B18.2.1—Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series).
2. ASME B18.2.3.8M—Metric Hex Lag Screws.
3. ASME B18.6.1—Wood Screws (Inch Series).
4. ASME B18.6.3—Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch Series).
5. ASME B18.6.7M—Metric Machine Screws.
6. ASME B18.21.1—Washes: Helical Spring-Lock, Tooth Lock, and Plain Washers (Inch Series).
7. ASME B18.21.2M—Lock Washers (Metric Series).
8. ASME B18.22.1—Plain Washers.
9. ASME B18.22M—Metric Plain Washers.

D. American Welding Society (AWS)

1. AWS D1.1/D1.1M—Structural Welding Code – Steel.
2. AWS D1.2/D1.2M—Structural Welding Code – Aluminum.
3. AWS D1.3/D1.3M—Structural Welding Code – Sheet Steel.
4. AWS D1.6/D1.6M—Structural Welding Code – Stainless Steel.

E. Environmental Protection Agency (EPA)

1. EPA Method 24—Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings.

F. Federal Regulations (FR)

1. 40 CFR 59—National Volatile Organic Compound Emission Standards for Consumer and Commercial Products.

G. National Association of Architectural Metal Manufacturers (NAAMM)

1. NAAMM MBG 531—Metal Bar Grating Manual.

H. Society for Protection Coatings (SSPC)

1. SSPC-PA1—Shop, Field, and Maintenance Painting of Steel.
2. SSPC-SP6/NACE No. 3—Commercial Blast Cleaning.
3. SSPC-SP10/NACE No. 2—Near-White Blast Cleaning.
4. SSPC-Paint 20—Zinc-Rich Primers Type I Inorganic and Type II Organic.
5. SSPC-Paint 29—Zinc Dust Sacrificial Primer, Performance-Based.
6. SSPC-Zone 1A—Interior, Normally Dry.
7. SSPC-Zone 1B—Exterior, Normally Dry.

I. Specialty Steel Industry of North America (SSINA)

1. SSINA No. 6 Finish—Satin Finish.

1.05 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, Structural Welding Code—Steel.
2. AWS D1.2/D1.2M, Structural Welding Code—Aluminum.
3. AWS D1.3/D1.3M, Structural Welding Code—Sheet Steel.
4. AWS D1.6/D1.6M, Structural Welding Code—Stainless Steel.

1.06 PROJECT REQUIREMENTS

A. Structural Performance of Ladders: The Contractor shall provide ladders capable of withstanding the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.

B. Thermal Movements: Provide exterior metal fabrications that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120°F, ambient; 180°F, material surfaces.

1.07 PROJECT CONDITIONS

A. Field Measurements: The Contractor shall verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on shop drawings.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
2. Provide allowance for trimming and fitting at site.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 Articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include but are not limited to products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include but are not limited to manufacturers specified.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.02 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For metal fabrications exposed to view in the completed

Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.03 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

1. Unless noted otherwise, steel that is not stainless steel shall be galvanized with a G90 coating conforming to ASTM A123/A123M.

B. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666, Type 316L.

C. Stainless-Steel Bars and Shapes: ASTM A276/A276M, Type 316L.

D. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.

E. Steel Pipe: ASTM A53/A53M, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

2.04 ALUMINUM ALLOY PRODUCTS

A. Aluminum Sheet Plates: Conforming to ASTM B209.
B. Aluminum Extrusions: Conforming to ASTM B221.
C. Aluminum Castings: Conforming to ASTM B108/B108M.

2.05 FASTENERS

A. General: For all exterior applications and where fastening aluminum, provide Type 304 stainless-steel fasteners. Provide hot-dipped galvanized fasteners in all other applications in accordance with ASTM A153/A153M unless noted otherwise on the Drawings. Select fasteners for type, grade, and class required.

B. High-Strength Bolts and Nuts: ASTM F3125/F3125M with heavy hex nuts ASTM A563 and hardened carbon-steel washers ASTM F436/F486M.

C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A (Property Class 4.6); with hex nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.

D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, nuts, and flat washers; ASTM F593 for bolts and ASTM F594 for nuts, Alloy Group A4.

E. Stainless Steel Socket Button and Flat Countersunk Head Cap Screws: ASTM F879.

F. Anchor Bolts: ASTM F 1554, Grade 36.

G. Eyebolts: ASTM A489.

H. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).

I. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

J. Wood Screws: Flat head, ASME B18.6.1.

K. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M).

L. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M).

M. Cast-in-Place Anchors in Concrete: Anchors capable of sustaining without failure a load equal to four times the load imposed, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.

1. Threaded or wedge type; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized in accordance with ASTM A153/A153M.

N. Expansion Anchors: Anchor bolt and sleeve assembly with ability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M conducted by a qualified independent testing agency.

1. Material for Anchors in Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633, Class Fe/Zn 5.
2. Material for Anchors in Exterior Locations: Alloy Group (A4) stainless-steel bolts complying with ASTM F593 and nuts complying with ASTM F594 (ASTM F836M).

2.06 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Shop Primers: Provide primers that comply with Division 9, Finishes.

C. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.

1. Use primer with a VOC content of 3.5 pounds/gallon or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Available Products:

a. Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.
b. Carboline Company; Carbozinc 621.
c. ICI Devoe Coatings; Catha-Coat 313.
d. International Coatings Limited; Interzinc 315 Epoxy Zinc-Rich Primer.
e. PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.
f. Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.
g. Tnemec Company, Inc.; Tneme-Zinc 90-97.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

E. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

F. Nonshrink, Metallic Grout: Factory-packaged, ferrous-aggregate grout complying with ASTM C1107/C1107M, specifically recommended by the manufacturer for heavy-duty loading applications.

G. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by the manufacturer for interior and exterior applications.

2.07 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to the greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work true to line and level with accurate angles, surfaces, and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that will be exposed to weather so as to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of the type indicated and coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 inch by 1-1/2 inches with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.08 METAL BOLLARDS

A. Steel Pipe Bollards: Fabricate pipe bollards from Schedule 80 steel pipe. Fill bollards with concrete.

1. Where bollards are indicated to receive push-button controls for door operators, provide necessary cutouts for push-button controls and hole for wire.

B. Fabricate bollards with 3/8-inch-thick steel base plates for bolting to concrete slab. Drill baseplates at all four corners for 3/4-inch anchor bolts.

1. Where bollards are to be anchored to sloping concrete slabs, angle baseplates for plumb alignment of bollards.

C. Fabricate sleeves for bollard anchorage from steel pipe or tubing with 1/4-inch-thick steel plate welded to bottom of sleeve. Make sleeves not less than 8 inches deep and 3/4 inch larger than OD of bollard.

D. Fabricate internal sleeves for removable bollards from Schedule 40 steel pipe or 1/4-inch wall-thickness steel tubing with an OD approximately 1/16 inch less than ID of bollards. Match drill sleeve and bollard for 3/4-inch steel machine bolt.

2.09 MISCELLANEOUS METAL FABRICATIONS

A. Loose Bearing and Leveling Plates: Flat, free from warps or twists, and of the required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.

B. Miscellaneous Framing and Supports

1. Provide steel framing and supports for applications indicated that are not a part of structural steel framework as required to complete the Work.
2. Fabricate units to sizes, shapes, and profiles indicated and required to receive other adjacent construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items.
3. Galvanize miscellaneous framing and supports in all locations.

2.10 FINISHES, GENERAL

A. Comply with NAAMM's *Metal Finishes Manual for Architectural and Metal Products* for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.11 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

1. ASTM A123/A123M, for galvanizing steel and iron products.
2. ASTM A153/A153M, for galvanizing steel and iron hardware.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Exteriors (SSPC Zone 1B) and Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3.
2. Interiors (SSPC Zone 1A): SSPC-SP 10.

C. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1 for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.12 STAINLESS STEEL FINISHES

A. Remove tool and die marks and stretch lines or blend into finish.

B. Dull Satin Finish: SSINA No. 6 Finish.

C. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 EXECUTION

3.01 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

3.02 INSTALLING METAL BOLLARDS

A. Anchor bollards to existing construction with anchor bolts. Provide four 3/4-inch bolts at each bollard, unless otherwise indicated.

1. Embed anchor bolts at least 4 inches in concrete.

B. Anchor bollards in concrete in formed or core-drilled holes not less than 8 inches deep and 3/4 inch larger than OD of bollard. Fill annular space around bollard solidly with nonshrink, nonmetallic grout mixed and placed to comply with the grout manufacturer’s written instructions. Slope grout up approximately 1/8 inch toward bollard.

C. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches above the bottom of the excavation. Place concrete and vibrate or

tamp for consolidation. Support and brace bollards in position until the concrete has cured.

D. Anchor internal sleeves for removable bollards in formed or core-drilled holes not less than 8 inches deep and 3/4 inch larger than OD of sleeve. Fill annular space around internal sleeves solidly with nonshrink, nonmetallic grout; mixed and placed to comply with grout manufacturer's written instructions. Slope grout up approximately 1/8 inch toward internal sleeve.

E. Anchor internal sleeves for removable bollards in place with concrete footings. Center and align sleeves in holes 3 inches above the bottom of the excavation. Place concrete and vibrate or tamp for consolidation. Support and brace sleeves in position until concrete has cured.

F. Place removable bollards over internal sleeves and secure with 3/4-inch machine bolts and nuts. After tightening nuts, drill holes in bolts for inserting padlocks. The Owner will furnish padlocks.

G. Fill bollards solidly with concrete, mounding top surface to shed water.

1. Do not fill removable bollards with concrete.

3.03 INSTALLING BEARING AND LEVELING PLATES

A. The Contractor shall clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean the bottom surface of bearing plates.

B. Set loose leveling and bearing plates on wedges or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if they are protruding cut off flush with the edge of the bearing plate before packing with grout.

1. Use non-shrink, metallic grout in concealed locations where not exposed to moisture; use non-shrink, nonmetallic grout in exposed locations, unless otherwise indicated.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.04 ADJUSTING AND CLEANING

The Contractor shall do the following:

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9, Finishes.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION

DIVISION 9

FINISHES

SECTION 09900
PAINTING AND COATING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes materials for and application of painting and coating systems for the following surfaces:

1. Buried metal.
2. PVC.

B. It does not include coating steel water tanks and reservoirs.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. Submit manufacturer's data sheets showing the following information:

1. Percent solids by volume.
2. Minimum and maximum recommended dry-film thickness per coat for prime, intermediate, and finish coats.
3. Recommended surface preparation.
4. Recommended thinners.
5. Statement verifying that the specified prime coat is recommended by the manufacturer for use with the specified intermediate and finish coats.
6. Application instructions including recommended equipment and temperature limitations.
7. Curing requirements and instructions.

C. Submit color swatches.

D. Submit certificate identifying the type and gradation of abrasives used for surface preparation.

E. Submit material safety data sheets for each coating.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM A780/A780M—Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
2. ASTM C501—Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser.
3. ASTM D520—Standard Specification for Zinc Dust Pigment.
4. ASTM D522/D522M—Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
5. ASTM D1002—Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal).
6. ASTM D2240—Standard Test Method for Rubber Property—Durometer Hardness.
7. ASTM D2697—Standard Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings.
8. ASTM D2794—Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
9. ASTM D3734—Standard Specification for High-Flash Aromatic Naphthas.
10. ASTM D4060—Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
11. ASTM D4138—Standard Practices for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive, Cross-Sectioning Means.
12. ASTM D4258—Standard Practice for Surface Cleaning Concrete for Coating.
13. ASTM D4260—Standard Practice for Liquid and Gelled Acid Etching of Concrete.
14. ASTM D4261—Standard Practice for Surface Cleaning Concrete Masonry Units for Coating.
15. ASTM D4263—Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
16. ASTM D4787—Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates.

17. ASTM D6386—Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
18. ASTM D7091—Standard Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals.
19. ASTM E84—Standard Test Method for Surface Burning Characteristics of Building Materials.

B. American Water Works Association (AWWA)

1. AWWA C203—Coal-Tar Protective Coatings and Linings for Steel Water Pipe.
2. AWWA C209—Tape Coatings for Steel Water Pipe and Fittings.

C. International Concrete Repair Institute (ICRI)

1. ICRI CSP 3-5—Light to Medium-Heavy Shotblast.
2. ICRI CSP 5—Medium-Heavy Shotblast.

D. National Association of Corrosion Engineers International (NACE)

1. NACE No. 6—Surface Preparation of Concrete.
2. NACE SP0188—Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.

E. NSF International (NSF)

1. NSF 61/600—Drinking Water System Components – Health Effects.

F. Steel Structure Painting Council (SSPC)

1. SSPC PA-1—Shop, Field, and Maintenance Coating of Metals.
2. SSPC PA-2—Procedure for Determining Conformance to Dry Coating Thickness Requirements.
3. SSPC SP-1—Solvent Cleaning.
4. SSPC SP-2—Hand Tool Cleaning.
5. SSPC SP-3—Power Tool Cleaning.
6. SSPC SP-5/NACE No. 1—White Metal Blast Cleaning.
7. SSPC SP-6/NACE No. 3—Commercial Blast Cleaning.
8. SSPC SP-7/NACE No. 4—Brush-Off Blast Cleaning.
9. SSPC SP-8—Pickling.

10. SSPC SP-10/NACE No. 2—Near-White Metal Wet Abrasive Blast Cleaning.
11. SSPC SP-11—Power-Tool Cleaning to Bare Metal.
12. SSPC SP WJ-1—Waterjet Cleaning of Metals – Clean to Bare Substrate.
13. SSPC SP WJ-2—Waterjet Cleaning of Metals – Very Thorough Cleaning.
14. SSPC SP WJ-3—Waterjet Cleaning of Metals – Thorough Cleaning.
15. SSPC SP WJ-4—Waterjet Cleaning of Metals – Light Cleaning.

G. U.S. Department of Defense (MIL)

1. MIL-C-18480B—Coating Compound, Bituminous, Solvent, Coal-Tar Base.
2. MIL-DTL-5541F—Chemical Conversion Coatings on Aluminum and Aluminum Alloys.
3. MIL-P-21035B—Paint High Zinc Dust Content, Galvanizing Repair.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 MATERIALS

2.01 PAINTING AND COATING SYSTEMS

The following index lists the various painting and coating systems by service and generic type:

PAINT COATINGS SYSTEM INDEX		
No.	Title	Generic Coating
Buried Metal Coating Systems		
21.	Buried Metal	Epoxy
24.	Buried Metal	Corrosion-resisting grease
PVC Coating System		
41.	PVC, Ultraviolet Exposure or Color Coding	Polyurethane

These systems are specified in detail in the following Paragraphs. For each coating, the required surface preparation, prime coat, intermediate coat (if required), topcoat, and coating thicknesses are described. Mil thicknesses shown are minimum dry-film thicknesses.

A. Buried Metal Coating Systems

1. System No. 21—Buried Metal:

a. Type: High solids Cycloaliphatic Amine epoxy or phenolic epoxy having minimum volume solids of 80% (ASTM D2697).
b. Service Conditions: Buried metal, such as valves, flanges, bolts, nuts, structural steel, and fittings.
c. Surface Preparation: Solvent clean in accordance with SSPC SP-1 to remove contaminants from the surface. Abrasive blast in accordance with SSPC SP-10.
d. Coating System: Apply three or more coats of Ameron 400; Tnemec 104 HS (6.0 to 8.0 mils per coat); ICI Devoe Bar-Rust 233H; Carboline 890LT; Sherwin-Williams Tank Clad HS B62-80 Series/B60V80 Series at 5.0 to 8.0 mils/coat or equal; 30 mils total. Maximum thickness of an individual coating shall not exceed the manufacturer's recommendation.

2. System No. 24—Buried Metal:

a. Type: Corrosion-resisting grease.
b. Service Conditions: Buried metal, such as bolts, bolt threads, tie rods, and nuts.
c. Surface Preparation: Solvent clean in accordance with SSPC SP-1 to remove contaminants from the surface. Power tool clean in accordance with SSPC SP-3 as a minimum. Abrasive blasting in accordance with SSPC-SP-6/NACE No. 3 is preferred.
d. Coating: NO-OX-ID GG-2 as manufactured by Sanchem, Inc. Apply to a minimum thickness of 1/4 inch.

B. PVC Coating System

1. System No. 41—PVC, Ultraviolet Exposure or Color Coding:

a. Type: Epoxy primer with minimum volume solids of 54% and a pigmented polyurethane enamel having a minimum volume solids of 66%.

b. Service Conditions: Color coding of PVC or exposed to sunlight.
c. Surface Preparation: Clean the surface per SSPC SP-1, Solvent Cleaning. Then, lightly abrade the surface with medium-grain sandpaper.
d. Prime Coat: One coat of Tnemec Series N69 Epoxoline; International 7510; Ameron 385; ICI Devoe Devran 224 HS; Sherwin-Williams Macropoxy 646 B58 Series/B58V600 at 5.0 to 8.0 mils DFT; Carboline 888 or 890; PPG PITT-GUARD® Direct-to-Rust Epoxy Mastic Coating 97-145 Series; or equal. Apply to a minimum dry-film thickness of 4 mils.
e. Finish Coat: One coat of Tnemec Series 1075; International Interthane 990HS; Ameron 450 HS; ICI Devoe Devran 379; Carboline 134 HG; Sherwin-Williams Hi-Solids Polyurethane B65-300 Series/B60V30 at 3.0 to 4.0 mils DFT; PPG PITTHANE® Ultra-Gloss Urethane Enamel 95-812 Series; or equal. Apply to a minimum dry-film thickness of 3 mils.

C. Abrasives for Surface Preparation

1. Abrasives used for preparation of ferrous (excluding stainless steel) surfaces shall be one of the following:

a. 16- to 30- or 16- to 40-mesh silica sand or mineral grit.
b. 20- to 40-mesh garnet.
c. Crushed iron slag, 100% retained on No. 80 mesh.
d. SAE Grade G-40 or G-50 iron or steel grit.

2. Abrasives used for preparation of stainless steel surfaces shall be 20- to 40-mesh silicon carbide or aluminum oxide.

3. Abrasives used for preparation of concrete and masonry surfaces shall be 16- to 30- or 16- to 40-mesh silica sand.

4. In the above gradations, 100% of the material shall pass through the first stated sieve size and 100% shall be retained on the second stated sieve size.

PART 3 EXECUTION

3.01 WEATHER CONDITIONS

A. Do not paint in the rain, wind, snow, mist, or fog or when steel or metal surface temperatures are less than 5°F above the dew point.

B. Do not apply paint when the relative humidity is above 85%.

C. Do not paint when temperature of metal to be painted is above 120°F.

D. Do not apply alkyd, inorganic zinc, silicone aluminum, or silicone acrylic paints if air or surface temperature is below 40°F or expected to be below 40°F within 24 hours.

E. Do not apply epoxy, acrylic latex, and polyurethane paints on an exterior or interior surface if air or surface temperature is below 60°F or expected to drop below 60°F in 24 hours.

3.02 SURFACE PREPARATION PROCEDURES

A. Remove oil and grease from metal surfaces in accordance with SSPC SP-1. Use clean cloths and cleaning solvents and wipe dry with clean cloths. Do not leave a film or greasy residue on the cleaned surfaces before abrasive blasting. Powerwashing with a biodegradable degreaser is also acceptable.

B. Remove weld spatter and weld slag from metal surfaces and grind smoothly rough welds, beads, peaked corners, and sharp edges including erection lugs in accordance with SSPC SP-2 and SSPC SP-3. Grind 0.020 inch (minimum) off the weld caps on pipe weld seams. Grind outside sharp corners, such as the outside edges of flanges, to a minimum radius of 1/4 inch.

C. Do not abrasive blast or prepare more surface area in one day than can be coated in one day; prepare surfaces and apply coatings the same day. Remove sharp edges, burrs, and weld spatter. Prime all areas before rust bloom forms and within the same day.

D. Do not abrasive blast PVC piping or equipment. Do not abrasive blast epoxy- or enamel-coated pipe that has already been factory coated, except to repair scratched or damaged coatings.

E. For carbon steel, do not touch the surface between the time of abrasive blasting and the time the coating is applied. Apply coatings within 2 hours of blasting or before any rust bloom forms.

F. Surface preparation shall conform to the SSPC specifications as follows:

Solvent Cleaning	SP-1
Hand Tool Cleaning	SP-2
Power Tool Cleaning	SP-3
White Metal Blast Cleaning	SP-5
Commercial Blast Cleaning	SP-6

Brush-Off Blast Cleaning	SP-7
Pickling	SP-8
Near-White Blast Cleaning	SP-10
Power Tool Cleaning to Bare Metal	SP-11
Surface Preparation of Concrete	SP-13
Waterjet Cleaning of Metals – Clean to Bare Substrate	SP WJ-1
Waterjet Cleaning of Metals – Very Thorough Cleaning	SP WJ-2
Waterjet Cleaning of Metals – Thorough Cleaning	SP WJ-3
Waterjet Cleaning of Metals – Light Cleaning	SP WJ-4

G. Wherever the words "solvent cleaning," "hand tool cleaning," "wire brushing," or "blast cleaning" or similar words are used in these Specifications or in the paint manufacturer's specifications, they shall be understood to refer to the applicable SSPC (Steel Structure Painting Council), surface preparation specifications listed above.

H. *Dust blasting* is defined as cleaning the surface through the use of very fine abrasives, such as siliceous or mineral abrasives, 80 to 100 mesh. Apply a fine etch to the metal surface to clean the surface of any contamination or oxide and to provide a surface profile for the coating.

I. *Brush-off blasting* of concrete and masonry surfaces is defined as opening subsurface holes and voids and etching the surface for a coating to bond.

J. For carbon steel surfaces, after abrasive blast cleaning, the height of the surface profile shall be 2 to 3 mils. Verify the surface profile by measuring with an impresser tape acceptable to the Owner's Representative. Perform a minimum of one test per 100 square feet of surface area. Testing shall be witnessed by the Owner's Representative. The impresser tape used in the test shall be permanently marked with the date, time, and locations where the test was made. Test results shall be promptly presented to the Owner's Representative.

K. Do not apply any part of a coating system before the Owner's Representative has reviewed the surface preparation. If coating has been applied without this review, if directed by the Owner's Representative, remove the applied coating by abrasive blasting and reapply the coat in accordance with this Specification.

3.03 ABRASIVE BLAST CLEANING

A. Use dry abrasive blast cleaning for metal surfaces. Do not use abrasives in automatic equipment that have become contaminated. When shop or field blast cleaning with handheld nozzles, do not recycle or reuse blast particles.

B. After abrasive blast cleaning and before coating is applied, dry clean surfaces to be coated by dusting, sweeping, and vacuuming to remove residue from blasting.

Apply the specified primer or touch-up coating within an 8-hour working day. Do not apply coating over damp or moist surfaces. Reclean any blast-cleaned surface not coated within the 8-hour period before applying primer or touch-up coating.

C. Keep the area of the work in a clean condition and do not permit blasting particles to accumulate and constitute a nuisance or hazard.

D. During abrasive blast cleaning, prevent damage to adjacent coatings. Schedule blast cleaning and coating so that dust, dirt, blast particles, old coatings, rust, mill scale, etc., will not damage or fall upon wet or newly coated surfaces.

3.04 COATING STAINLESS STEEL

A. Solvent clean in accordance with SSPC SP-1. Solvents and cleaning solutions shall contain less than 200 mg/L of halogens. Then abrasive blast to give a surface profile of 2.0 to 3.0 mils. Refer to the coatings for the correct surface profile. Use coatings that are low in chloride content.

B. Do not apply inorganic zinc primers to stainless steel if such primers are specified in the painting system required. Apply only the intermediate and finish coats in such cases.

3.05 PROCEDURES FOR ITEMS HAVING SHOP-APPLIED PRIME COATS

A. After applying primer to surfaces, allow coating to cure for a minimum of 2 hours before handling to minimize damage.

B. When loading for shipment to the project site, use spacers and other protective devices to separate items to prevent damaging the shop-primed surfaces during transit and unloading. If wood spacers are used, remove wood splinters and particles from the shop-primed surfaces after separation. Use padded chains or ribbon binders to secure the loaded items and minimize damage to the shop-primed surfaces.

C. Cover shop-primed items 100% with protective coverings or tarpaulins to prevent deposition of road salts, fuel residue, and other contaminants in transit.

D. Handle shop-primed items with care during unloading, installation, and erection operations to minimize damage. Do not place or store shop-primed items on the ground or on top of other work unless the ground or work is covered with a protective covering or tarpaulin. Place shop-primed items above the ground upon platforms, skids, or other supports.

3.06 PAINTING SYSTEMS

A. All materials of a specified painting system, including primer, intermediate, and finish coats, shall be produced by the same manufacturer. Thinners, cleaners, driers, and other additives shall be as recommended by the paint manufacturer for the particular coating system.

B. Deliver paints to the jobsite in the original, unopened containers.

3.07 PAINT STORAGE AND MIXING

A. Store and mix materials only in areas designated for that purpose by the Owner's Representative. The area shall be well ventilated, with precautionary measures taken to prevent fire hazards. Post "No Smoking" signs. Storage and mixing areas shall be clean and free of rags, waste, and scrapings. Tightly close containers after each use. Store paint at an ambient temperature from 50°F to 100°F.

B. Prepare multiple-component coatings using all of the contents of the container for each component as packaged by the paint manufacturer. Do not use partial batches. Do not use multiple-component coatings that have been mixed beyond their pot life. Provide small quantity kits for touch-up painting and for painting other small areas. Mix only the components specified and furnished by the paint manufacturer. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.

3.08 PROCEDURES FOR THE APPLICATION OF COATINGS

A. Conform to the requirements of SSPC PA-1. Follow the recommendations of the coating manufacturer, including the selection of spray equipment, brushes, rollers, cleaners, thinners, mixing, drying time, temperature and humidity of application, and safety precautions.

B. Stir, strain, and keep coating materials at a uniform consistency during application. Power mix components. For multiple component materials, premix each component before combining. Apply each coating evenly, free of brush marks, sags, runs, and other evidence of poor workmanship. Use a different shade or tint on succeeding coating applications to indicate coverage where possible. Finished surfaces shall be free from defects or blemishes.

C. Do not use thinners unless recommended by the coating manufacturer. If thinning is allowed, do not exceed the maximum allowable amount of thinner per gallon of coating material. Stir coating materials at all times when adding thinner. Do not flood the coating material surface with thinner before mixing. Do not reduce

coating materials more than is absolutely necessary to obtain the proper application characteristics and to obtain the specified dry-film thicknesses.

D. Remove dust, blast particles, and other debris from blast cleaned surfaces by dusting, sweeping, and vacuuming. Allow ventilator fans to clean airborne dust to provide good visibility in working area before applying coating. Remove dust from coated surfaces by dusting, sweeping, and vacuuming before applying succeeding coats.

E. Apply coating systems to the specified minimum dry-film thicknesses as determined in accordance with SSPC PA-2.

F. Apply primer immediately after blast cleaning and before any surface rusting occurs, or any dust, dirt, or any foreign matter has accumulated. Before applying coating, re-clean surfaces that have surface colored or become moist by blast cleaning.

G. Apply a brush coat of primer on welds, sharp edges, nuts, bolts, and irregular surfaces before applying the primer and finish coat. Apply the brush coat before and in conjunction with the spray coat application. Apply the spray coat over the brush coat.

H. Before applying subsequent coats, allow the primer and intermediate coats to dry for the minimum curing time recommended by the manufacturer. In no case shall the time between coats exceed the manufacturer's recommendation.

I. Each coat shall cover the surface of the preceding coat completely and there shall be a visually perceptible difference in applied shade or tint of colors.

J. Applied coating systems shall be cured at 75°F or higher for 48 hours. If temperature is lower than 75°F, curing time shall be in accordance with printed recommendations of the manufacturer, unless otherwise allowed by the Owner's Representative.

K. Assembled parts shall be disassembled sufficiently before painting or coating to ensure complete coverage by the required coating.

3.09 SURFACES NOT TO BE COATED

A. Do not paint the surfaces listed below unless otherwise noted in the drawings or in other Specification sections. Protect the following surfaces during the painting of adjacent areas:

1. Concrete walkways.

2. Stainless steel.
3. Metal letters.
4. Glass.
5. Fencing.
6. Electrical fixtures except for factory coatings.
7. Nameplates.
8. Grease fittings.
9. Buried pipe, unless specifically required in the piping specifications.

3.10 PROTECTION OF SURFACES NOT TO BE PAINTED

A. Remove, mask, or otherwise protect hardware, lighting fixtures, switch plates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be painted. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process. Mask openings in motors to prevent paint and other materials from entering the motors.

3.11 SURFACES TO BE COATED

A. The exact coating to be applied in any location is not designated by the descriptive phrases in the coating system titles such as “corrosive environment,” “buried metal,” or “submerged metal.” Coat surfaces with the specific coating systems as described below:

1. Coat mechanical equipment, such as pumps as described in the various mechanical equipment specifications. The color of the finish coat shall match the color of the connecting piping.
2. Coat aboveground and exposed piping or piping in vaults and structures as described in the various piping specifications as shown in the Piping Schedule in the drawings. The color of the finish coat shall be as shown in the Piping Schedule in the drawings.
3. Coat valves as described in the various valve specifications. Aboveground valves, or valves in vaults and structures, shall match the color of the connecting piping.
4. Coat concrete surfaces where shown in the drawings.
5. Coat buried flanges, nuts and bolts, valves, flexible pipe couplings, exposed rebar in thrust blocks, and valve boxes as specified in the particular specifications for the above items. Coat buried bolt threads, tie bolt threads, and nuts as specified in System No. 24.

3.12 DRY-FILM THICKNESS TESTING

A. Measure coating thickness specified for carbon steel surfaces with a magnetic-type dry-film thickness gauge in accordance with SSPC PA-2. Provide certification that the gauge has been calibrated by a certified laboratory within the past 6 months. Provide dry-film thickness gauge as manufactured by Mikrotest or Elcometer.

B. Test the finish coat of metal surfaces (except zinc primer and galvanizing) for holidays and discontinuities with an electrical holiday detector, low-voltage, wet-sponge type. Provide measuring equipment. Provide certification that the gauge has been calibrated by a certified laboratory within the past 6 months. Provide detector as manufactured by Tinker and Rasor or K-D Bird Dog.

C. Check each coat for the correct dry-film thickness. Do not measure within 8 hours after application of the coating.

D. For metal surfaces, make five separate spot measurements (average of three readings) spaced evenly over each 100 square feet of area (or fraction thereof) to be measured. Make three readings for each spot measurement of either the substrate or the paint. Move the probe or detector a distance of 1 to 3 inches for each new gauge reading. Discard any unusually high or low reading that cannot be repeated consistently. Take the average (mean) of the three readings as the spot measurement. The average of five spot measurements for each such 100 square-foot area shall not be less than the specified thickness. No single spot measurement in any 100-square-foot area shall be less than 80% nor more than 120% of the specified thickness. One of three readings which are averaged to produce each spot measurement may underrun by a greater amount as defined by SSPC PA-2.

E. For concrete surfaces, make five separate spot measurements spaced evenly over each 100 square feet of area (or fraction thereof) to be measured. The average of five spot measurements for each such 100-square-foot area shall not be less than the specified thickness. No single spot measurement in any 100-square-foot area shall be less than 80% nor more than 120% of the specified thickness.

F. Perform tests in the presence of the Owner’s Representative.

3.13 REPAIR OF IMPROPERLY COATED SURFACES

A. If the item has an improper finish color or insufficient film thickness, clean and topcoat the surface with the specified paint material to obtain the specified color and coverage. Sandblast or power-sand visible areas of chipped, peeled, or abraded paint, feathering the edges. Then prime and finish the coat in accordance

with the Specifications. The work shall be free of runs, bridges, shiners, laps, or other imperfections.

3.14 CLEANING

A. During the work, remove discarded materials, rubbish, cans, and rags at the end of each day's work.

B. Thoroughly clean brushes and other application equipment at the end of each period of use and when changing to another paint or color.

C. Upon completion of painting work, remove masking tape, tarps, and other protective materials, using care not to damage finished surfaces.

END OF SECTION

DIVISION 15

MECHANICAL

SECTION 15055
PIPING SYSTEMS—GENERAL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Specification describes responsibilities and requirements for piping systems including the following:

1. Labor, materials, tools, equipment, and services to be furnished in accordance with the provisions of the Contract Documents. The materials to be used for the piping systems shown in the Drawings are listed by service in the Piping Schedule, included in the Contract Drawings.
2. Coordination of work with other trades.
3. Furnishing and installing all supplementary or miscellaneous items, appurtenances, and devices incidental to or necessary for a sound, secure, and complete installation, although such work is not specifically indicated.
4. Furnishing Record Drawings and documents for piping systems.

1.02 SUBMITTALS

The Contractor shall submit the following in accordance with Section 01330, Submittals and Acceptance:

A. If the Contractor deviates from the piping layout as shown on the Contract Drawings, the Contractor shall submit scaled piping drawings showing locations and dimensions to and from fittings, valves, tanks, equipment, structures, and related appurtenances. Provide scaled drawings to a minimum scale of 1 inch equals 10 feet. Provide details to minimum scale of 1/8 inch equals 1 foot. Elevations shall correspond to reference vertical elevation datum shown or provided for this project.

B. Copies of any manufacturer's written directions regarding material handling, delivery, storage, and installation.

C. Record piping drawings shall meet the requirements of Section 01785, Record Documents. During the work, the Contractor shall maintain accurate, up-to-date Record Drawings of piping systems installed in the project, including pre-existing piping discovered, relocated, or at locations other than as originally shown on the Drawings. When the work is completed and accepted by the Owner and the Engineer, the Contractor shall submit Record Drawings in accordance with Section 01785, Record Documents. The Contractor shall identify complete

location, elevations, and description of piping systems. Piping systems and fittings are to be identified from three points on structures and/or stationary appurtenances.

D. Submit copies of forms documenting required field pressure testing work and results.

E. Submit welding certificate copies.

F. Submit certified copies of mill test reports for bolts and nuts, including coatings if specified. Provide recertification by an independent domestic testing laboratory for materials originating outside of the United States.

G. Submit manufacturer's data sheet for gaskets supplied showing dimensions and bolting recommendations.

H. Support Systems:

1. Drawings of each piping system locating each support, guide, and anchor.
2. Identify support, guide, and anchor type by catalog number and shop/ contract drawing detail number.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society of Mechanical Engineers (ASME)

1. ASME B1.1—Unified Inch Screw Threads (UN and UNR Thread Form).
2. ASME B1.20.1—Pipe Threads, General Purpose (Inch).
3. ASME B16.21—Nonmetallic Flat Gaskets for Pipe Flanges.
4. ASME B18.2.1—Square, Hex, Heavy Hex, and Askew Head Bolts, and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series).
5. ASME B18.2.2—Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series).
6. ASME B31.1—Power Piping.
7. ASME B31.3—Process Piping.
8. ASME BPVC—Boiler and Pressure Vessel Code.

B. American Society for Testing and Materials (ASTM)

1. ASTM A183—Specification for Carbon Steel Track Bolts and Nuts.
2. ASTM A193/A193MM—Standard Specification for Alloy-Steel; and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
3. ASTM A194/A194M—Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both.
4. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
5. ASTM D1330—Standard Specification for Rubber Sheet Gaskets.
6. ASTM F467—Standard Specification for Nonferrous Nuts for General Use.

C. American Water Works Association (AWWA)

1. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
2. AWWA C207—Steel Pipe Flanges for Waterworks Service, Sizes 4-Inch through 144-Inch (100 mm through 3,600 mm).

D. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS)

1. MSS SP-58—Pipe Hangars and Supports – Material, Design, and Manufacture, Selection, Application, and Installation.

E. NSF International (NSF)

1. NSF 61/600—Drinking Water System Components – Health Effects.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. The Contractor shall protect the pipe from kinks, cuts, end damage, and other defects when transporting all piping. Binding and tie-down methods shall not

damage or deflect the pipes in any way. Pipe damaged during shipment shall be rejected.

C. Pipe shall be stored on level ground, preferably turf or sand, free of sharp objects that could damage the pipe. Stacking of any pipe shall be limited to a height that will not cause excessive deformation of the lower layers of pipe under anticipated temperature conditions. When necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such widths to not allow deformation of the pipe at the point of contact with the sleeper or between supports. Pipe shall not be removed from storage until bedding or sub-grade work is complete and ready to receive the pipe.

D. The joined pipe shall be handled in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. Ropes, fabric, or rubber-protected slings and straps shall be used when handling pipe. Chains, cables, or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe. Pipe or fittings shall not be dropped. Slings for handling joined pipe shall not be positioned at socket-welded joints. Sections of the pipes with cuts and gouges shall be removed and the ends of the pipe rejoined. In accordance with the pipe manufacturer's written instructions, the Contractor shall repair all pipe with damaged linings and pipe exterior coatings that have been damaged before the pipe is installed.

E. The Contractor shall cover all pipe stored on the site with canvas or other opaque material to protect it from sunlight. Provide air circulation under the covering.

F. The Contractor shall inspect all pipe, fittings, and other accessories upon delivery and during the work. Any defective or damaged materials found during field inspection or during tests shall be removed from the site and replaced by, and at the expense of, the Contractor.

G. The interior of all pipe, fittings, and other accessories shall be kept free from dirt and foreign matter at all times. Fittings shall be drained and stored in a manner that will protect them from damage by freezing.

H. Gaskets shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-delivered-to-site and first-to-be-installed rotation basis. Mechanical-joint glands, bolts, and washers shall be handled and stored in a manner that will ensure proper use with respect to types and sizes.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

1.07 DEFINITIONS OF BURIED, EXPOSED, AND SUBMERGED PIPING

A. Buried piping is piping buried in soil, beneath a structure and/or encased in concrete. Where an exterior pipe coating is specified to be factory- or field-applied, the Contractor shall provide the coating up to the penetration of a structure. Piping encased in concrete does not require an exterior coating other than what is factory furnished.

B. Exposed piping is piping in any of the following conditions or locations:

1. Above ground.
2. Inside buildings, vaults, or other structures.
3. In underground concrete trenches or galleries.

C. Submerged piping is considered to be all piping within a liquid holding tank.

1.08 SYSTEM DESIGN REQUIREMENTS

A. General

1. The Specifications and Drawings are not all inclusive of explicit piping details; provide piping for intended use in compliance with laws and regulations, including ASME B31.1 Code (Power Piping).
2. Pressure ratings and materials specified represent minimum acceptable standards for piping systems.
3. Piping Systems: Suitable for the services specified and intended.
4. Piping shall be color coded in accordance with the Department of Environmental Protection requirements.

B. Support Systems

1. The absence of pipe supports and details on the Drawings shall not relieve the Contractor of responsibility for sizing and providing supports for this project.

2. Select and design within the specified spans and component requirements.

3. Comply with requirements of MSS SP-58.

4. Criteria for structural design and selection of pipe support system components:

    a. Dead loads imposed by the weight of the pipes filled with water, within specified spans and component requirements, plus any insulation.
    b. Safety factor: Minimum of 5.

5. Design, size, and space support anchoring devices, including anchor bolts, inserts, and other devices used to anchor the support, to withstand the shear and pullout loads imposed by loading and spacing on each particular support.

    a. Piping smaller than 30 inches: Supports are shown only where specific types and locations are required; additional pipe supports may be required and are to be provided and installed by the Contractor at no additional cost to the Owner.

C. Adapters

1. No attempt has been made to show all adapters, spool pieces, reducers, bushings, or other fittings required to accommodate the connection of pipes, fittings, and valves of various joint design and sizes throughout the project. The Contractor is completely responsible for providing, at his expense, all adapters, reducers, sleeves, spool pieces, and other fittings and appurtenances necessary for connection of pipe (for the same pipe material of or a transition of pipe materials), valves, fittings, and appurtenances throughout the project, which shall be constructed of appropriate materials, coated and lined to match the materials, coatings, and linings specified for the connected components. All adapters, reducers, sleeves, spool pieces, and other fittings shall be coated and lined in accordance with the specifications for each individual pipe system.

D. Unions

1. No attempt has been made to show all unions required for the project. The Contractor shall provide unions at all connections of threaded pipe to installed equipment unless deleted by the Engineer, in writing, at certain locations. The unions shall meet or exceed the quality of materials, pressure rating, service, and painting requirements of connected piping.

PART 2 PRODUCTS

2.01 PIPING SYSTEM GENERAL REQUIREMENTS SCHEDULE

A. Unless noted otherwise in the Drawings, piping system materials, fittings, and appurtenances are subject to requirements of the individual Specifications for the piping systems.

2.02 PIPING SCHEDULE

A. A piping schedule (flow stream identification) listing the piping identification abbreviations, piping materials, operating pressures, field test pressures, lining systems, and color coding associated with the flow streams is provided on the Contract Drawings. In project locations where the piping system material referenced on the piping schedule is not appropriate, the required piping material is indicated on the Contract Drawings. Materials called out in the Contract Drawings shall govern over materials stated in the piping schedule.

2.03 THREAD FORMING FOR STAINLESS STEEL BOLTS

A. Form threads for stainless steel bolts by rolling, not by cutting or grinding.

2.04 BOLTS AND NUTS FOR FLANGES FOR DUCTILE IRON PIPE FLANGES

A. Bolts, washers, and nuts for pipe installed indoors, outdoors above and below ground, and in vaults and structures shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.

B. Bolts, washers, and nuts for submerged Class 150 flanges shall be Type 304 stainless steel conforming to ASTM A193/A193M (Grade B8) for bolts and ASTM A194/A194M (Grade 8) for nuts. Fit shall be Class 2A conforming to ASME B1.1 when connecting to cast-iron valves having body bolt holes.

2.05 BOLTS AND NUTS FOR TYPE 304 STAINLESS STEEL PIPE FLANGES

A. Bolts, washers, and nuts for flanges shall be Type 304 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

2.06 BOLTS AND NUTS FOR TYPE 316 STAINLESS STEEL PIPE FLANGES

A. Bolts, washers, and nuts for flanges shall be Type 316 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

2.07 BOLTS AND NUTS FOR PVC, CPVC, AND PVDF PIPE FLANGES

A. Bolts for piping in sodium hypochlorite service shall be made of titanium, in accordance with ASTM F467, Grade Ti1, Ti2, or Ti7. Nuts and washers shall conform to ASTM F467 and shall be made of titanium.

B. Bolts, washers, and nuts in chemical service other than sodium hypochlorite shall be Type 304 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

C. Bolts, washers, and nuts for buried and submerged flanges and flanges located outdoors above ground or in vaults and structures shall be Type 304 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

D. The Contractor shall provide a washer under each nut and under each bolthead. Washers shall be of the same material as the nuts.

2.08 BOLTS AND NUTS FOR STEEL PIPE FLANGES

A. Bolts, washers, and nuts for Class 150 flanges (including AWWA C207, Class D) located indoors, outdoors above ground, in vaults, and in structures shall be carbon steel, ASTM A307, Grade B. Bolts, washers, and nuts for buried service shall also be hot-dipped galvanized.

B. Bolts, washers, and nuts for submerged Class 150 flanges shall be Type 304 stainless steel conforming to ASTM A193/A193M (Grade B8) for bolts and ASTM A194/A194M (Grade 8) for nuts. Fit shall be Class 2A in accordance with ASME B1.1 when connecting to cast-iron valves having body bolt holes.

2.09 LUBRICANT FOR STAINLESS STEEL BOLTS AND NUTS

A. Anti-seize thread lubricant shall be applied to the thread portion of all (above grade and below grade) stainless steel bolts (stainless steel tie rods, etc.) during assembly. Anti-seize lubricant shall be chloride free and shall be nongalling NSF approved. Anti-seize thread lubricant shall be Jet-Lube “Nikal,” John Crane “Thred Gard Nickel,” Never-Seez “Pure Nickel Special,” or Permatex “Nickel Anti-Seize.”

2.10 FLANGE GASKETS FOR STEEL, DUCTILE IRON, AND STAINLESS STEEL PIPE

A. Flange gaskets shall be in accordance with AWWA C207, except as modified in this Section. Gaskets shall be ring type. All gasket material shall be suitable for

the fluid being conveyed and shall be resistant to free chlorine concentrations up to 10 mg/L. All gasket material shall be rated to the surge pressures listed in the pipe schedule. Gaskets shall be EPDM, Viton, or an approved equal.

2.11 FLANGE GASKETS FOR DUCTILE-IRON PIPE AND FITTINGS IN RAW SEWAGE

A. Gaskets shall be full face, 1/8 inch thick, Buna-N having a Brinell Hardness of 55 to 65 durometer. Gaskets shall be suitable for a water pressure of 200 psi at a temperature of 250°F. Gaskets shall have "nominal" pipe size inside diameters, not the inside diameters indicated in ASME B16.21. Provide Garlock Style 9122 or equal. The Contractor shall verify that the gaskets are compatible with all chemicals being used.

2.12 FLANGE GASKETS FOR PVC AND CPVC PIPE

A. Gaskets for flanged joints shall be full faced, 1/8 inch thick, having a Brinell Hardness of 50 to 70 durometer A. Gasket material shall be EPR unless noted or specified otherwise. Gasket material for sodium hypochlorite service shall be Viton ETP unless noted or specified otherwise. Gaskets shall be compatible with the fluids conveyed.

2.13 FLANGE GASKETS FOR PVDF PIPE

A. Gaskets for flanged joints shall be full faced, 5/64 inch thick (minimum), made of Teflon-bonded EPDM or PVDF-bonded EPDM. The EPDM shall have a Brinell Hardness of 65 to 70 Durometer “A.” Gaskets shall be suitable for a fluid temperature range of -40˚F to +210˚F and compatible with the fluids conveyed.

2.14 FLANGE GASKETS FOR STAINLESS STEEL PIPE IN CHEMICAL SERVICE

A. Gaskets shall be suitable for a maximum pressure of 300 psi and a maximum temperature of 500°F. The Contractor shall verify that the gaskets are compatible with the fluids conveyed. Gaskets for chemical service shall be one of the following materials:

1. Teflon-envelope type, full face, 1/8 inch thick, with compressed nonasbestos filler. Provide free-flow design in which the Teflon is machined or milled between leaves to provide a space for the filler.
2. Teflon (PTFE) with inert filler, 1/8 inch thick. Product: Garlock "Gylon 3510" shall be used for potassium hydroxide, sodium hypochlorite, and ammonium hydroxide. Garlock “Gylon 3545” shall be used for sulfuric acid, corrosion inhibitor, and hydrofluosilicic acid.

2.15 POTABLE WATER PIPING SYSTEMS

A. All potable water piping systems including pipe, valves, fittings, weld-solvents, linings, gaskets, lubricants, grout disinfection agents, and surfaces in contact with potable water shall meet all local and State of Florida regulations and requirements including NSF 61/600. The Contractor shall coordinate the color of the potable water system piping color with the Owner's color standard and shall provide color as approved by the Owner.

2.16 LOCATOR WIRE (OR DETECTABLE PIPELINE MARKING TAPE)

A. All 2-inch and larger buried piping shall be laid with two insulated, 12-gauge minimum AWG, THWN strand copper wires taped with adhesive-backed tape or tied to the nonmetallic pipe at 5 feet on center for location purposes.

PART 3 EXECUTION

3.01 PREPARATION

A. Field Alignment

1. The piping shown on the Contract Drawings is generally indicative of the work, with symbols and notations provided for clarity. However, the Contract Drawings are not an exact representation of all conditions involved; therefore, install piping to suit actual field conditions and measurements as approved by the Engineer. No extra compensation will be made for work due to differences between indicated and actual dimensions.
2. The Contractor shall install all adapters, fittings, flanged connections, closures, restrained joints, etc. not specified but necessary for a complete installation acceptable to the Engineer.
3. The Contract Drawings do not indicate all adapters, fittings, spool pieces, bushings, unions, supports, hangers, and other items required to accommodate the installing and connecting of pipe, fittings, valves, and equipment of various joint designs and sizes. Provide such required items of appropriate designs, materials, coatings, and linings.
4. An extensive network of underground piping, duct, conduit, direct-buried conductors, and related structures of various sizes, materials, alignments, age, and function exist within the project site. Conclusive information concerning these facilities is not available. Consequently, the design of new piping indicated on the Contract Drawings is approximate. Adjust alignment, fitting, valve, and joint locations as required and as approved by the Engineer to accommodate and protect existing facilities and provide the intended functionality of new piping.

3.02 FIELD LAYOUT AND MODIFICATIONS

A. Unless directed otherwise, the Contractor shall be responsible for setting construction layout stakes and/or offsets required to complete the designated work. The Contractor shall ensure that those stakes and/or offsets are protected and any re-staking required for any reason including work stoppage shall be included in the bid price and no additional compensation to the Contractor will be made.

B. The Engineer has the right to make any modifications the Engineer deems necessary due to field conditions, conflicts with other utilities, or to protect other properties.

3.03 PIPE PRODUCTS INSPECTION

A. The Contractor shall obtain from the pipe manufacturer a certificate of inspection to the effect that the pipe, fittings, gaskets, glands, bolts, and nuts supplied for this Contract have been inspected at the plant and that they meet the requirements of these Specifications. The Contractor shall submit these certificates to the Engineer before installing the pipe materials. The Contractor shall visually inspect all pipe and fittings at delivery and before they are lowered into the trench to be installed. Pipe or fittings that do not conform to these Specifications or have been damaged in any manner will be rejected and the Contractor must remove them immediately. The entire product of any plant may be rejected when, in the opinion of the Engineer, the methods or quality assurance and uniformity of manufacturer fail to secure acceptable and uniform pipe products or where the materials used produce inferior pipe products.

3.04 REMOVAL OF EXISTING PIPE AND FITTINGS

A. Pipe specifically identified on the Drawings to be removed or replaced from service shall be physically taken out of the ground. The limits of pipe to be removed shall be specifically called for in the plans or shall be approved in writing by the Engineer. Any other removal not specifically called for shall be approved in writing and shall be considered incidental to construction of other items in the contract and the Contractor will not receive compensation for such work.

B. When removing pipe the Contractor shall excavate a trench wide enough to dislodge the pipe from the surrounding soil and long enough to be able to handle the pipe without causing any damage to nearby utilities, structures, or adjacent property.

C. The removed pipe, fitting, and appurtenances will become the Contractor's property and the Contractor shall be responsible for proper disposal and any required permits for disposal.

D. Regarding pipe remaining in the ground subsequent to removal of connected pipe or pipe fittings, the remaining buried pipes, openings, and fittings shall be plugged or capped as approved by the Engineer.

E. Pipe that will be abandoned in place shall be plugged or capped as approved by the Engineer.

3.05 BURIED PIPING AND PIPE FITTINGS

A. Trenching and backfilling for all pipe and fittings shall also be in accordance with Section 02305, Earthwork for Utilities.

B. Installation

1. Inspect all piping for defects and remove all lumps or excess coatings before installation. The inside of the mechanical joint and outside of plain-end pipe shall be cleaned before joining pipe. Caution shall be taken to prevent damage to the pipe during lowering into the trench. Remove all foreign matter that has entered the pipe during storage and installation. The Contractor shall cover the pipe ends during installation to prevent debris from entering the pipe. No debris, tools, clothing, or other material shall be placed in the pipe.
2. After being placed in the trench, the pipe shall be brought to the proper line and grade by compacting the approved backfill material under it, except at the bell end. Joint deflection shall not exceed 75% of the manufacturer's limit.
3. The Contractor shall install temporary water-tight plugs on the pipe ends during the time that the pipe is in the trench but no work is in progress. If there is water in the trench upon beginning work, this plug shall remain in place until the trench has been pumped dry, unless otherwise approved by the Engineer, the Engineer’s Representative, or the Owner’s Representative.
4. Buried carbon steel bolts and nuts shall be coated in accordance with the manufacturer’s recommendations.
5. Coat threaded portions of stainless steel bolts and nuts with lubricant before assembly.
6. Restrained plugs or caps shall be inserted into all buried dead end pipes, tees, or crosses. Provide blind flanges for all flanged exposed piping. Restrained plugs and caps installed for pressure testing shall be fully secured and blocked to withstand the test pressure.

7. Where plugging is required because of contract division or phasing for later connection, the ends of such lines shall be equipped with a suitable cast-iron or ductile-iron plug/cap or blind flange with or without a blowoff cock, as shown on the Drawings. Installation or removal of such plugging shall be considered incidental to the work and the Contractor shall not be compensated by the Owner for performing this work.

3.06 FLANGED JOINTS FOR EXPOSED PIPE AND FITTINGS

A. When bolting flanged joints, the Contractor shall avoid restraint on the opposite end of the pipe or fitting, which would prevent uniform gasket compression or which would cause unnecessary stress in the flanges. One flange shall be free to move in any direction while the flange bolts are being tightened. Bolts shall be tightened gradually and at a uniform rate to ensure uniform compression of the gasket, in accordance with pipe and fitting manufacturer's recommendations.

B. Coat threaded portions of stainless steel bolts and nuts with lubricant before assembly.

3.07 PIPING CONNECTIONS TO PUMPS AND OTHER EQUIPMENT

A. When connecting to pumps and equipment, the Contractor shall ensure that piping stresses are not transmitted to the pump and equipment. All connecting pipe shall be permanently supported and aligned so that accurate matching of bolt holes and uniform contact over the entire surface of pump flanges are obtained before any bolts are installed in the flanges or pipe is threaded into pump and equipment. In addition, pump connection piping shall be free to move parallel to its longitudinal center line while the bolts are being tightened.

1. Pumps and equipment shall be leveled, aligned, and wedged into a position that will fit the connecting pipe, but shall not be grouted until the initial fitting and alignment of the pump and equipment may be shifted on its foundation if necessary to properly install the connecting pipe. Each pump and piece of equipment shall, however, be grouted before final bolting of the connecting piping.
2. After final alignment and bolting, the pump and equipment connections shall be tested for applied piping stresses by loosening the flange bolts which, if the piping is properly installed, should result in no movement of the piping relative to the pump or opening of the pump connection joints. If any movement is observed, the piping shall be loosened and re-aligned as required and then the flanges bolted back together. The flange bolts then shall be loosened and the process repeated until no movement is observed.

3. All carbon steel bolts and nuts shall be coated with the same exterior coating applied to the piping system.

3.08 ANCHORING AND RESTRAINING

A. Thrust blocks shall be used in new lines and shall be limited to areas in which a new fitting has been installed in an existing line and field restraining joints are not feasible or when directed by the Engineer.

3.09 FLUSHING, CLEANING, TESTING, AND INSPECTION OF PIPING

A. See Section 15144, Pressure Testing of Piping, for the requirements of pipe flushing, cleaning, pressure testing, and inspection requirements.

3.10 DISINFECTION

A. See Section 15141, Disinfection of Piping and Water Storage Facilities, for the disinfection requirements.

3.11 SPECIAL REQUIREMENTS AND PIPING SPECIALTIES

A. Welding

1. Use only certified welders meeting procedures and performance outlined in Section IX of the ASME BPVC and other codes and requirements in accordance with local building and utility requirements. Submit Welder's certificates to the Engineer for the project record before beginning any welding on the project. The Welder must be certified for all positions (flat, vertical, and overhead).
2. Have all welds conform to highest industrial practice in accordance with ASME B31.1 and ASME B31.3 or other codes and requirements in accordance with local building and utility requirements.

3.12 PIPE COLOR CODING

A. The pipe color shall be as identified on the Drawings. The Contractor shall coordinate with the Engineer and the Owner to generate a list of acceptable pipe colors for exposed piping systems. On applicable pipes, the color shall be in accordance with FDEP color-coding requirements.

END OF SECTION

SECTION 15075
PROCESS EQUIPMENT, PIPING, AND VALVE IDENTIFICATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes requirements for materials and installation of markers, labels, and signs for pipes, and valves; for mechanical equipment; for hazardous materials warnings.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. The Contractor shall submit manufacturer's catalog data and descriptive literature describing materials, colors, letter size, and size of labels.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in the Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American National Standards Institute (ANSI)

1. ANSI Z535.1—Safety Colors.

B. American Society of Mechanical Engineers (ASME)

1. ASME A31.1—Scheme for Identification of Piping Systems.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 LABELS FOR PIPING

A. Labels for piping shall bear the full piping system name as shown in the Piping Schedule on the Drawings. The Contractor shall provide separate flow directional arrows next to each label. Color, size, and labeling shall conform to ASME A13.1 and ANSI Z535.1. Labels for piping inside buildings shall be vinyl cloth: W.H. Brady Co. B-500 vinyl cloth, Seton Name Plate Corporation Pipe Markers, or equal. Labels for piping located outdoors shall be weather- and UV-resistant acrylic plastic and shall be W. H. Brady Co. B-946, Seton Name Plate Corporation Pipe Markers, or equal.

B. Alternatively, the Contractor shall provide preprinted, semirigid, snap-on, color-coded pipe markers. Color, size, and labeling shall conform to ASME A13.1 and ANSI Z535.1. Label shall cover 360º (minimum). Labels shall be fabricated of weather- and UV-resistant acrylic plastic. Labels shall be Seton Nameplate Corporation SetMark pipe marks or equal.

2.02 LABELS FOR VALVES

A. The Contractor shall provide each valve listed on the Tag Number list with an identification tag. The tag shall be 2-inch-square or circular aluminum or 1/16-inch-thick fiberglass: W. H. Brady B-60, Seton Name Plate Corp. Series SVT, or equal. Aluminum tags shall have black-filled letters. The tag shall show the valve name.

2.03 HOSE BIBB SIGNS—UNSAFE WATER

A. The Contractor shall provide a rigid sign labeled "DANGER--UNSAFE WATER" for each hose bibb. Size and lettering shall conform to OSHA requirements. Signs shall be Seton Nameplate Company 20-gauge baked enamel, minimum size 7 inches by 3 inches; Brady B-120 Fiber-Shield fiberglass, minimum size 7 inches by 3 inches, 1/8 inch thick; or equal.

2.04 LABELS FOR MECHANICAL EQUIPMENT

A. The Contractor shall provide a label for each pump or other piece of mechanical equipment. The label shall show the equipment name and tag number as shown on

the Tag Number list or on the Drawings. Labels shall be 1-1/2 inches (minimum) by 4 inches (minimum) brass, aluminum, or 1/8-inch-thick fiberglass tags.

2.05 UNDERGROUND PLASTIC WARNING TAPE FOR PIPE

A. The Contractor shall provide permanent, bright-colored, continuous-printed plastic tape intended for direct burial service, not less than 6 inches wide by 3.5 mils thick. Provide tape with printing that most accurately indicates the type of service of buried pipe. Provide the following colored tape for the various piping services:

Service	Color
Cable TV	Orange
Gas	Yellow
Electric	Red
Telephone	Orange
Water	Blue
Sewer	Green
Chemical	Yellow
Reclaimed Water	Violet

2.06 UNDERGROUND DETECTABLE METALLIC PIPE WARNING TAPE

A. The Contractor shall provide permanent, bright-colored, continuous-printed tape consisting of an aluminum or steel foil sheathed in a plastic laminate, not less than 3 inches wide by 5 mils thick. Provide tape with printing that most accurately indicates the type of buried service. Provide the following colored tape for the various piping services:

Service	Color
Cable TV	Orange
Gas	Yellow
Electric	Red
Telephone	Orange
Water	Blue
Sewer	Green
Chemical	Yellow
Reclaimed Water	Violet

PART 3 EXECUTION

3.01 INSTALLING PIPE LABELS

A. The Contractor shall provide a label and flow arrow at each connection to pumps or other mechanical equipment, at wall boundaries, at tees and crosses, and at 20-foot centers on straight runs of piping.

B. On piping having external diameters less than 6 inches (including insulation, if any), the Contractor shall provide full-band pipe markers, extending 360º around pipe at each location.

C. On piping having external diameters of 6 inches and larger (including insulation, if any), provide either full-band or strip-type pipe markers but not narrower than three times letter height (and of required length), fastened by one of the following methods:

1. Laminated or bonded application of pipe marker to pipe or insulation.
2. Strapped-to-pipe or insulation application of semirigid type with Type 304 or 305 stainless steel bands.

3.02 INSTALLING VALVE AND EQUIPMENT LABELS

A. The Contractor shall attach labels to the valve or piece of equipment with Type 304 or 316 stainless steel chains unless otherwise noted.

B. The Contractor shall attach valve labels to the valve handwheels. If the valve has no handwheel, attach the label to the valve by tying the tag wire or chain around the operating shaft or nut.

3.03 INSTALLING MISCELLANEOUS SIGNS

A. The Contractor shall attach miscellaneous signs according to the sign manufacturer's recommendations and in accordance with OSHA requirements.

3.04 INSTALLING UNDERGROUND PLASTIC WARNING TAPE FOR PIPE

A. During backfilling of each exterior underground piping system, the Contractor shall install continuous underground-type plastic line marker directly over buried line at 6 to 8 inches above the top of the pipe. Where multiple small lines are buried in a common trench and do not exceed an overall width of 16 inches, install a single line marker.

3.05 INSTALLING UNDERGROUND DETECTABLE METALLIC PIPE WARNING TAPE

A. The Contractor shall install tape 4 to 6 inches below finished ground surface directly over buried pipelines. Where multiple small pipelines are buried in a common trench and do not exceed an overall width of 16 inches, install a single marker tape.

END OF SECTION

SECTION 15110
MANUAL, CHECK, AND PROCESS VALVES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all valves as shown in the Drawings and as specified in this Section. All valves shall be complete with all necessary manual actuators, valve boxes, extension stems, and floor stands, which are required for proper valve operation and completion of the work.

1. All valves shall be of the sizes shown in the Drawings. All equipment of the same type shall be from one manufacturer, unless authorized in writing by the Engineer.

2. The valves shall include but not be limited to the following:

a. Air valves.
b. Ball valves.
c. Gate valves.
d. Plug valves.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product technical submittal data shall contain the following information and data:

1. Acknowledgment that products submitted meet requirements of standards referenced.

2. Manufacturer’s installation instructions.

3. Manufacturer’s operation and maintenance manuals.

4. Data of valves, actuators, and accessories:

a. Pressure and temperature rating.
b. Materials of construction, with ASTM reference and grade.
c. Linings and coatings.

d. Dimensions and weight.
e. Flow coefficient.
f. Actuators and accessories details.
g. Manufacturer's product brochure, cut-sheets, and parts diagrams.

B. Dimensions and orientation of valve actuators as installed on the valves. Show location of internal stops for gear actuators. State differential pressure and fluid velocity used to size actuators. For worm-gear actuators, state the radius of the gear sector in contact with the worm and state the handwheel diameter.

C. The following test reports: Performance Tests; Leakage Tests; Hydrostatic Tests; and Proof-of-Design Tests as applicable or required.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Petroleum Institute (API)

1. API SPEC 6D—Specification for Valves.
2. API STD 6FA—Standard for Fire Test for Valves.
3. API STD 594—Check Valves: Flanged, Lug, Wafer, and Butt-Welding.
4. API STD 607—Fire Test for Quarter-Turn Valves and Valves Equipped with Nonmetallic Seats.

B. American Society for Testing of Materials (ASTM)

1. ASTM A36/A36M—Standard Specification for Carbon Structural Steel.
2. ASTM A47/A47M—Standard Specification for Ferritic Malleable Iron Castings.
3. ASTM A48/A48M—Standard Specification for Gray Iron Castings.
4. ASTM A105/A105M—Standard Specification for Carbon Steel Forgings for Piping Applications.
5. ASTM A108—Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
6. ASTM A126—Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
7. ASTM A148/A148M—Standard Specification for Steel Castings, High Strength, for Structural Purposes.
8. ASTM A181/A181M—Standard Specification for Carbon Steel Forgings, for General-Purpose Piping.

9. ASTM A182/A182M—Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.
10. ASTM A193/A193M—Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications.
11. ASTM A194/A194M—Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
12. ASTM A216/A216M—Standard Specification for Steel Castings, Carbon, Suitable for Fusion-Welding, for High-Temperature Service.
13. ASTM A240/A240M—Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
14. ASTM A269/A269M—Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
15. ASTM A276/A276M—Standard Specification for Stainless Steel Bars and Shapes.
16. ASTM A313/A313M—Standard Specification for Stainless Steel Spring Wire.
17. ASTM A322—Standard Specification for Steel Bars, Alloy, Standard Grades.
18. ASTM A351/A351M—Standard Specification for Castings, Austenitic, for Pressure-Containing Parts.
19. ASTM A395/A395M—Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures.
20. ASTM A436—Standard Specification for Austenitic Gray Iron Castings.
21. ASTM A439/A439M—Standard Specification for Austenitic Ductile Iron Castings.
22. ASTM A449—Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use.
23. ASTM A479/A479M—Standard Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels.
24. ASTM A494/A494M—Standard Specification for Castings, Nickel and Nickel Alloy.
25. ASTM A516/A516M—Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service.
26. ASTM A536—Standard Specification for Ductile Iron Castings.
27. ASTM A564/A564M—Standard Specification for Hot-Rolled and Cold-Finished Age-Hardening Stainless Steel Bars and Shapes.
28. ASTM A582/A582M—Standard Specification for Free-Machining Stainless Steel Bars.

29. ASTM A666—Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
30. ASTM A743/A743M—Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application.
31. ASTM A744/A744M—Standard Specification for Castings, Iron-Chromium-Nickel, Corrosion Resistant, for Severe Service.
32. ASTM A890/A890M—Standard Specification for Castings, Iron-Chromium-Nickel-Molybdenum Corrosion-Resistant, Duplex (Austenitic/Ferritic) for General Application.
33. ASTM B16/B16M—Standard Specification for Free-Cutting Brass Rod, Bar, and Shapes for Use in Screw Machines.
34. ASTM B21/B21M—Standard Specification for Naval Brass Rod, Bar, and Shapes.
35. ASTM B61—Standard Specification for Steam or Valve Bronze Castings.
36. ASTM B62—Standard Specification for Composition Bronze or Ounce Metal Castings.
37. ASTM B98/B98M—Standard Specification for Copper-Silicon Alloy Rod, Bar, and Shapes.
38. ASTM B99/B99M—Standard Specification for Copper-Silicon Alloy Wire for General Applications.
39. ASTM B127—Standard Specification for Nickel-Copper Alloy Plate, Sheet, and Strip.
40. ASTM B148—Standard Specification for Aluminum-Bronze Sand Castings.
41. ASTM B150/B150M—Standard Specification for Aluminum Bronze Rod, Bar, and Shapes.
42. ASTM B164—Standard Specification for Nickel-Copper Alloy Rod, Bar, and Wire.
43. ASTM B169/B169M—Standard Specification for Aluminum Bronze Sheet, Strip, and Rolled Bar.
44. ASTM B193—Standard Test Method for Resistivity of Electrical Conductor Materials.
45. ASTM B371/B371M—Standard Specification for Copper-Zinc-Silicon Alloy Rod.
46. ASTM B427—Standard Specification for Gear Bronze Alloy Castings.
47. ASTM B443—Standard Specification for Nickel-Chromium-Molybdenum-Columbium Alloy and Nickel-Chromium-Molybdenum-Silicon Alloy Plate, Sheet, and Strip.
48. ASTM B446—Standard Specification for Nickel-Chromium-Molybdenum-Columbium Alloy (UNS N06625), Nickel-Chromium-Molybdenum-Silicon Alloy (UNS N06219), and Nickel-Chromium-Molybdenum-Tungsten Alloy (UNS N06650) Rod and Bar.

49. ASTM B462—Standard Specification for Forged or Rolled Nickel Alloy Pipe Flanges, Forged Fittings, and Valves and Parts for Corrosive High-Temperature Service.
50. ASTM B463—Standard Specification for UNS N08020 Alloy Plate, Sheet, and Strip.
51. ASTM B472—Standard Specification for Nickel Alloy Billets and Bars for Reforging.
52. ASTM B584—Standard Specification for Copper Alloy Sand Castings for General Applications.
53. ASTM B763/B763M—Standard Specification for Copper Alloy Sand Castings for Valve Applications.
54. ASTM D1248—Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.
55. ASTM D1784—Standard Classification System and Basis for Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
56. ASTM D1785—Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
57. ASTM D2000—Standard Classification System for Rubber Products in Automotive Applications.
58. ASTM D3222—Standard Specification for Unmodified Poly (Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials.
59. ASTM D4101—Standard Classification System and Basis for Specification for Polypropylene Injection and Extrusion Materials.
60. ASTM F441/F441M—Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.
61. ASTM F467—Standard Specification for Non-ferrous Nuts for General Use.
62. ASTM F468—Standard Specification for Non-ferrous Bolts, Hex Cap Screws, Socket Head Cap Screws, and Studs for General Use.

C. American Society of Mechanical Engineers (ASME)

1. ASME B1.20.1—Pipe Threads, General Purpose (Inch).
2. ASME B1.20.7—Hose Coupling Screw Threads (Inch).
3. ASME B16.1—Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250.
4. ASME B16.5—Pipe Flanges and Flanged Fittings NPS 1/2 through NPS 24 Metric/Inch Standard.
5. ASME B16.10—Face-to-Face and End-to-End Dimensions of Valves.
6. ASME B16.11—Forged Fittings, Socket-Welding and Threaded.
7. ASME B16.18—Cast Copper Alloy Solder Joint Pressure Fittings.
8. ASME B16.24—Cast Copper Alloy Pipe Flanges, Flanged Fittings, and Valve Classes 150, 300, 600, 900, 1500, and 2500.

9. ASME B16.34—Valves – Flanged, Threaded, and Welding End.
10. ASME B16.42—Ductile Iron Pipe Flanges and Flanged Fittings Classes 150 and 300.
11. ASME B16.47—Large Diameter Steel Flanges NPS 26 through NPS 60 Metric/Inch Standard.
12. ASME B36.10M—Welded and Seamless Wrought Steel Pipe.

D. American Society of Safety Engineers (ASSE)

1. ASSE 1011—Performance Requirements for Hose Connection Vacuum Breakers.

E. American Water Works Association (AWWA)

1. AWWA C110/A21.10—Ductile-Iron and Gray-Iron Fittings.
2. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
3. AWWA C115/A21.15—Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
4. AWWA C207—Steel Pipe Flanges for Waterworks Service, Sizes 4-Inch through 144-Inch (100 mm through 3,600 mm).
5. AWWA C500—Metal-Seated Gate Valves for Water Supply Service.
6. AWWA C504—Rubber-Sealed Butterfly Valves.
7. AWWA C507—Ball Valves 6-Inch through 60-Inch (150 mm through 1,500 mm).
8. AWWA C508—Swing-Check Valves for Waterworks Service, 2-Inch through 48-Inch (50 mm through 1,200 mm) NPS.
9. AWWA C509—Resilient-Seated Gate Valves for Water Supply Service.
10. AWWA C512—Air Release, Air/Vacuum, and Combination Air Valves for Water and Wastewater Service.
11. AWWA C515—Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service.
12. AWWA C550—Protective Interior Coatings for Valves and Hydrants.
13. AWWA C606—Grooved and Shouldered Joints.
14. AWWA C800—Underground Service Line Valves and Fittings.

F. Fluid Controls Institute (FCI)

1. ANSI/FCI 70-2—Control Valve Seat Leakage.

G. Manufacturers Standardization Society (MSS)

1. MSS SP-61—Pressure Testing of Valves.
2. MSS SP-67—Butterfly Valves.

3. MSS SP-68—High Pressure Butterfly Valves with Offset Design.
4. MSS SP-81—Stainless-Steel or Stainless-Steel-Lined, Bonnetless, Knife Gate Valves with Flanged Ends.
5. MSS SP-83—Class 3000 Steel Pipe Unions Socket Welding and Threaded (Carbon Steel, Alloy Steel, Stainless Steel, and Nickel Alloy).
6. MSS SP-108—Resilient-Seated Cast Iron Eccentric Plug Valves.

H. National Association of Corrosion Engineers International (NACE)

1. NACE AMPP MR0103—Petroleum, Petrochemical, and Natural Gas Industries – Metallic Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments.
2. NACE AMPP MR0175/ISO15156—Petroleum and Natural Gas Industries – Materials for Use in H2S-Containing Environments in Oil and Gas Production.

I. National Fluid Power Association (NFPA)

1. NFPA T3.6.7—Fluid Power Systems and Products – Square Head Industrial Cylinders – Mounting Dimensions.
2. NFPA T3.6.68—Fluid Power – Square Head Cylinders – Determination of the Static Failure Pressure Rating of Pressure-Containing Components.

J. NSF International (NSF)

1. NSF 61/600—Drinking Water System Components – Health Effects.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. All valves, unless otherwise directed, shall be loaded and unloaded by lifting, and under no circumstances shall valves be dropped, skidded, or rolled. Valves shall not be stacked or placed under pipe, fittings, or other valves in such a manner that damage could result.

C. Slings, hooks, or tongs used for lifting shall be padded in such a manner as to prevent damage to exterior surface or interior linings and valve components. If any part of the coating, lining, or components is damaged, the repairs or replacement shall be made by the Contractor at his expense and in a manner satisfactory to the Engineer before attempting to install such valves.

D. Only new valves will be allowed for installation and shall be stored in a manner to prevent damage and be kept free of dirt, mud, or other debris.

1.06 QUALIFICATIONS

A. All of the valves shall be products of well-established firms which are fully experienced, reputable, have been selling this product for a minimum of 10 years, and are qualified in the manufacture of the particular product furnished. The valves shall be designed, constructed, and installed in accordance with the requirements and procedures of applicable AWWA standards and shall comply with these Specifications as applicable.

1.07 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

1.08 VALVE TYPE CLASSIFICATIONS

A. Air Valves (Type 100 series)

1. Type 125: Combination Air Valves for Water Services, Single Body.
2. Type 140: Air Valves for Sewage Services, Air Release.

B. Ball Valves (Type 200 series)

1. Type 221: Full-Port Threaded Stainless-Steel Ball Valves, 2 Inches and Smaller, for Water Service.
2. Type 231: Full-Port Threaded Carbon-Steel Ball Valves, 2 Inches and Smaller.

C. Gate Valves (Type 600 series)

1. Type 637: Ductile-Iron Resilient Wedge Tapping Gate Valves, 4 Inches through 16 Inches (AWWA C515).
2. Type 682: Cast-Iron Resilient Wedge Gate Valves, 3 Inches through 20 Inches, for Buried Service (AWWA C509).

D. Plug Valves (Type 900 series)

1. Type 920: Cast-Iron Non-Lubricated Eccentric Plug Valves, 4 Inches and Larger.

PART 2 PRODUCTS

2.01 GENERAL

A. Valves are identified in the Drawings by size and type number. For example, a callout of 36V300 refers to a 36-inch-diameter Type 300 valve. A Type 300 valve is a flanged, rubber-seated butterfly valve that is 4 inches through 72 inches for exposed service.

B. All valves shall be complete with all necessary geared actuators, chainwheels and chains, handwheels, levers, valve bonnets, valve boxes, extension stems, operating nuts, and T-handle wrenches, which are required for proper valve operating and completing of the work included under this Section. Renewable parts including discs, packing, and seats shall be of types specified in this Section and acceptable by valve manufacturer for the intended service. All units shall have the name of the manufacturer and the size of the valve cast on the body or bonnet or shown on a permanently attached stainless-steel plate in raised embossed letters. All isolation valves shall be suitable for the intended service with bubble-tight shutoff to flow in either direction.

C. Bronze or brass components in contact with water shall comply with the following requirements:

Constituent	Content
Zinc	7% maximum
Aluminum	2% maximum
Lead	8% maximum
Copper + Nickel + Silicon	83% minimum

D. Valves and valve operators shall be factory prepared and primed and field finish coated in accordance with Section 09900, Painting and Coating.

2.02 VALVE ACTUATORS

A. The valve actuator shall be an integral part of a valve. The valve actuator shall be provided, installed, and adjusted by the valve manufacturer. Actuator mounting arrangements shall facilitate operation and maintenance and shall be determined by the valve manufacturer unless indicated otherwise on the Drawings or directed by the Engineer.

B. All valves shall open counter clockwise as viewed from the top. Unless otherwise required by the Owner, the direction of rotation of the wheel or wrench nut to open each valve shall be to the left (counterclockwise). Each valve body or actuator shall have the word "Open" cast on it and an arrow indicating the direction to open.

C. Actuators shall clearly indicate valve position and an adjustable stop shall be provided to set closing torque. All exposed nuts, bolts, and washers shall be AISI Type 304 stainless steel. Unless noted otherwise, valves shall be equipped with the following manual actuators:

1. Exposed Valves 6 Inches and Smaller: removable lever or handwheel actuators.
2. Exposed Valves 8 Inches and Larger: geared actuators with handwheels.
3. Buried or Submerged Valves 6 Inches and Smaller: 2-inch-square operating nuts (with valve bonnets, valve boxes, and extension stems as required) and T-handle wrench.
4. Buried or Submerged Valves 8 Inches and Larger: Geared actuators with 2-inch-square operating nuts (with valve bonnets, valve boxes, and extension stems as required) and wrench.

D. Levers or handwheels shall be provided to actuate the valves where the valves are within 6 feet and 7 inches from finished grade or the operating floor. Handwheels shall be constructed of ductile-iron. Levers and handwheels shall be coated in accordance with Section 09900, Painting and Coating. Handwheel diameters for traveling nut actuators shall not exceed 8 inches for valves 12 inches and smaller and shall not exceed 12 inches for valves 20 inches and smaller.

E. Chainwheel and guide actuators shall be provided for all exposed valves installed with their centerlines more than 6 feet and 9 inches above finished grade. Chainwheels shall be cast-iron with stainless-steel stem, clip, and pins. The actuating chain shall be AISI Type 304 stainless steel. Stainless-steel chain baskets shall also be provided with these units. Chainwheels shall be coated in accordance with Section 09900, Painting and Coating. Chainwheels and guides shall be Clow Figure F-5680, DeZurik Series W or LWG, Stockham, or equal.

F. Gear actuators for valves 8 inches through 20 inches shall be of the worm-and-gear or of the traveling-nut type. Gear actuators for valves 24 inches and larger shall be of the worm-and-gear type. Gear actuators for motorized valves shall be of the worm-and-gear type, regardless of size.

1. Gear actuators should be designed assuming that the differential pressure across the valves is equal to the test pressure of the connecting piping and

assuming a line fluid temperature range of 33°F to 125°F, unless otherwise required in the detailed valve specifications.

2. Gear actuators shall be enclosed and oil lubricated with seals provided on shafts to prevent entry of dirt and water into the actuator. Gear actuators for valves aboveground or in vaults and structures shall have handwheels. The actuators for valves in exposed service shall contain a dial indicating the position of the valve disc or plug.
3. Traveling nut and worm-and-gear actuators shall be of the totally enclosed design and proportioned to permit operation of the valve under full differential pressure rating of the valve with a maximum pull of 80 pounds on the handwheel or crank. Stop-limiting devices shall be provided in the actuators in the open and closed positions. Actuators shall be of the self-locking type to prevent the disc or plug from creeping. Design actuator components between the input and the stop-limiting devices to withstand without damage a pull of 200 pounds for handwheel or chainwheel actuators and an input torque of 300 foot-pounds for operating nuts when operating against the stops.
4. The self-locking worm gear shall be a one-piece design of gear bronze material (ASTM B427; or ASTM B584, Alloy C86200) that is accurately machine cut. Actuators for eccentric and lubricated plug valves may use ductile-iron gears provided the gearing is totally enclosed with spring-loaded rubber lip seals on the shafts. The worm shall be hardened alloy steel (ASTM A322, Grade G41500 or G41400; or ASTM A148/A148M, Grade 105-85) with thread ground and polished. Support worm-gear shafts at each end by ball or tapered roller bearings. The reduction gearing shall run in a proper lubricant. The handwheel diameter shall be no more than twice the radius of the gear sector in contact with the worm. Worm-gear actuators shall be Limitorque Model HBC, EIM Series W, or equal.

G. For buried or submerged service, provide watertight shaft seals and watertight valve and actuator cover gaskets. Provide totally enclosed actuators designed for buried or submerged service.

H. All buried valves shall have non-rising stems. All buried valves 3 feet below grade or deeper as measured at the valve centerline shall be furnished with an operator stem extension to extend the operating nut within 6 inches from the top of the valve box cover.

2.03 VALVE END CONNECTIONS

A. Provide valve end connections conforming to connected piping and as shown in the Drawings. Generally, all buried valves shall be mechanical joint type end connectors. Exposed valves shall be screwed-end, socket-weld end, or flanged to conform to adjacent exposed connected piping system.

B. Comply with the following standards:

1. Threaded: ASME B1.20.1.
2. Flanged: ASME B16.1 Class 125 unless other noted or AWWA C207.
3. Mechanical (gland) Type: AWWA C111/A21.11.
4. Soldered: ASME B16.18.

C. Nuts, Bolts, and Washers: Wetted or internal to be bronze or stainless-steel. Exposed to be zinc or cadmium-plated.

D. Epoxy Interior Coating: Provide epoxy coating for all interiors of ferrous valve body surfaces in accordance with AWWA C550. Coatings shall be NSF-approved for valves in all potable water piping services. Coatings shall not be required for stainless-steel valve interiors.

2.04 VALVE BOXES

A. All buried valves 2-inch size and larger shall be equipped with a standard cast-iron roadway valve box. Valve boxes shall be of the slip or sliding type with a round lid marked "Water" for potable water valves or “Sewer” for wastewater and a square lid marked “Reclaimed Water” for reclaimed water valves. The box shall be designed to prevent transfer of the surface loads directly to the valve or piping. Valve boxes must have a minimum adjustable range of 12 inches and a minimum inner diameter of 6 inches. All valve boxes and lids shall be produced from grey cast-iron conforming to the latest revision of specification for grey iron castings, ASTM A48/A48M, Class 20A-25A. All castings shall be true and free of holes and shall be cleaned according to good foundry practice, chipped and ground as needed to remove fins and rough places on castings. Valve boxes have to be rated to sustain FDOT H-20 loadings and have a minimum depth of 8 inches. The valve box lid shall fit flush in the top of the box without forcing and shall not rock, tip, or rattle.

B. Provide debris cap as required in the Drawings.

C. Coat buried cast-iron pieces as specified in Section 09900, Painting and Coating, System No. 21 or with fusion-bonded epoxy.

D. Valve boxes shall be as manufactured by Tyler Pipe, Geneco, Star Pipe Products, or equal.

2.05 EXTENSION STEMS

A. Where the depth of the valve is such that its centerline is more than 4 feet below grade, provide operating extension stems to bring the operating nut to a point 6 inches below the surface of the ground and/or box cover. Where the valve is submerged, provide operating extension stems to bring the operating nut to 6 inches above the water surface. Extension stems shall be Type 316 stainless steel, solid core, and shall be complete with 2-inch-square operating nut. The connections of the extension stems to the operating nuts and to the valves shall withstand without damage a pull of 300 foot-pounds.

B. Extension stem diameters shall be as tabulated below:

Valve Size (inches)	Minimum Extension Stem Diameter (inches)
2	3/4
3, 4	7/8
6	1
8	1-1/8
10, 12	1-1/4
14	1-3/8
16, 18	1-1/2
20, 24, 30, 36	1-3/4
42, 48, 54	2

C. Provide buried valves or valves located inside manholes or vaults with valve boxes cast in the manhole or vault roof with a valve position indicator designed to fit standard 5-1/4-inch valve boxes. The indicators shall show valve position and the direction and number of turns required to fully open (or close). All internal gearing shall be sealed. Ship each unit ready for field installation complete with valve box cast-iron adapter, capscrews, guide bushing, position indicator, flexible washer, centering plate, and 2-inch AWWA nut. Valve box and indicator shall be provided by the valve manufacturer. Indicators shall be Westran Position Indicator, Pratt Diviner, or equal.

2.06 FLOOR STANDS

A. When required by the installations, provide floor stands for the operation of valves. Floor stands shall be of the nonrising stem, indicating type, complete with steel extension stems, couplings, handwheels, stem guide brackets, and special yoke attachments as required by the valves and recommended and supplied by the stand manufacturer. Floor stands shall be cast-iron base type: Clow, Figure F-5515; Bingham and Taylor; Stockham; or equal. Handwheels shall turn counterclockwise to open the valves.

B. Provide Type 316 stainless-steel anchor bolts.

C. Provide Type 316 stainless-steel extension stems for valves in exposed service. Provide Type 316 stainless-steel stems for valves in submerged service.

D. Provide adjustable stem guide brackets for extension stems. The bracket shall allow valve stems to be set over a range of 2 to 36 inches from walls. Provide bushings drilled to accept up to 2-inch-diameter stems. Base, arm, and clamp shall be Type 316 stainless-steel. Bushing shall be bronze (ASTM B584, Alloy C86400 or C83600). Bolts, nuts, screws, and washers (including wall anchor bolts) shall be Type 316 stainless steel. Provide slots in the bracket to accept 3/4-inch bolts for mounting the bracket to the wall. Products: Trumbull Industries, Inc., Adjustable Stem Guide or equal.

2.07 BOLTS, NUTS, AND GASKETS FOR FLANGED VALVES

A. Bolts, nuts, and gaskets for flanged valves shall be as described in Section 15055, Piping Systems—General.

2.08 PAINTING AND COATING

A. Coat buried metal valves at the place of manufacture as specified in Section 09900, Painting and Coating, System No. 21.

2.09 AIR VALVES (TYPE 100 SERIES)

A. General Description

1. All valves shall meet or exceed all applicable provisions of the latest revision of AWWA C512. All valves for drinking water services shall comply with NSF 61/600. Design pressure is 150 psig. Valves shall be operable for water temperatures of above freezing to 125°F.
2. All valves shall consist of a float or a float assembly. Valves shall be identified properly in plates attached permanently on the valve body. The body and cover shall be cast-iron ASTM A126, Class B, or ASTM A48/A48M, Class 35. Valves 3 inches and smaller shall have threaded ends. Valves 4 inches and larger shall have flanged ends. Threaded ends shall comply with ASME B1.20.1. Flanges shall comply with ASME B16.1, Class 125. All flanges shall be flat faced.
3. The float shall be Type 304 or 316 Stainless-Steel. For valves with inlet sizes less than 4 inches, the float shall be able to withstand a collapse pressure of 1,000 psig. For inlet sizes 4 inches and larger, the float shall be capable of withstanding collapse pressures of 750 psig. Trim shall be Type 304 or 316 Stainless-Steel. The valve seat shall be of EPDM or other

rubber materials applicable to wastewater and sludge. The valve seat shall be easily removed and replaced in the field.

4. Drain/test ports on all valves with inlet size 1 inch or larger shall have two 1/2-inch NPT minimum plugged ports, one near the bottom of the valve body and the other near the top of the valve. The plug shall be of bronze, ASTM B584, Alloy C83600.

B. Type 125—Combination Air Valves for Water Services, Single Body

1. Type 125 combination air valve for water service shall be 1-inch through 4-inch inlet size. It shall consist of an air and vacuum valve with an air-release valve in a single-body double-orifice arrangement. The valve body and cover shall be constructed of ASTM A126 Class B cast-iron. The body inlet shall be baffled with a Buna-N float cushion. The floats shall be 300 series stainless-steel. The seats shall be Buna-N and provide drop tight shut-off. Valves shall be APCO 140C Series, Val-Matic Model 201C – 204C, or equal.

C. Type 140—Air Valves for Sewage Services, Air Release

1. Type 140 air valves for sewage service shall be A.R.I. Model S-025, or equal.

2.10 BALL VALVES (TYPE 200 SERIES)

A. Type 221—Full-Port Threaded Stainless-Steel Ball Valves, 2 Inches and Smaller, for Water Service

1. Stainless-steel ball valves 2 inches and smaller for water service shall be rated at a minimum pressure of 1,000 psi WOG at a temperature of 100°F. Provide full-port ball and body design. Valve body, ball, and stem shall be Type 316 stainless-steel, ASTM A276/A276M or A351. Seat and seals shall be reinforced PTFE. Valves shall have lever actuators, plastic coated. Valves shall have screwed ends (ASME B1.20.1) and nonblowout stems. Valves shall be Worcester Series 59, Apollo 86A-100 Series, or approved equal.

B. Type 231—Full-Port Threaded Carbon-Steel Ball Valves, 2 Inches and Smaller

1. Carbon-steel ball valves 2 inches and smaller shall be rated at a minimum pressure of 1,000 psi WOG at a temperature of 100°F. Valve body shall be carbon-steel, ASTM A216/A216M, Grade WCB. Ball shall be Type 316 stainless-steel or carbon-steel, chrome, or nickel-plated. Seat and seals shall be reinforced PTFE. Valves shall have lever handle, plastic coated.

Valves shall have screwed ends (ASME B1.20.1) and nonblowout stems. Valves shall be Worcester Series 59, Apollo 83A-140 Series, or approved equal.

2.11 BUTTERFLY VALVES (TYPE 300 SERIES) (NOT USED)

2.12 CHECK VALVES (TYPE 400 SERIES) (NOT USED)

2.13 DIAPHRAGM VALVES (TYPE 500 SERIES) (NOT USED)

2.14 GATE VALVES (TYPE 600 SERIES)

A. Type 637—Ductile-Iron Resilient Wedge Tapping Gate Valves, 4 Inches through 16 Inches (AWWA C515)

1. Valves shall comply with AWWA C515 and the following. Valves shall be of the bolted bonnet type with nonrising stems. Valve stems shall be Type 304 or 316 stainless-steel or cast, forged, or rolled bronze. Stem nuts shall be made of solid bronze. Bronze for internal working parts, including stems, shall not contain more than 2% aluminum nor more than 7% zinc. Bronze shall conform to ASTM B62 or ASTM B584 (Alloy C83600), except that the stem bronze shall have a minimum tensile strength of 60,000 psi, a minimum yield strength of 30,000 psi, and a minimum of 10% elongation in 2 inches (ASTM B584 or B763/B763M, Alloy C87600 or C99500). Body bolts shall be Type 316 stainless-steel. Ends shall be flanged, Class 125, ASME B16.1. One end shall have slotted bolt holes in accordance with AWWA C515, Paragraph 4.4.1.3.4 to fit tapping machines.
2. Provide reduction-thrust bearings above the stem collar. Stuffing boxes shall be O-ring seal type with two rings located in the stem above the thrust collar. Each valve shall have a smooth unobstructed waterway free from any sediment pockets.
3. Valves shall be lined and coated at the place of manufacture with either fusion-bonded epoxy or heat-cured liquid epoxy. Minimum epoxy thickness shall be 8 mil.
4. Manufacturers: Clow, AVK, American Flow Control, Mueller, Waterous, Kennedy, or equal.

B. Type 682—Cast-Iron Resilient Wedge Gate Valves, 3 Inches through 20 Inches, for Buried Service (AWWA C509)

1. Valves 2 inches and larger for buried service operation shall be of cast-iron or ductile-iron body construction and conform to AWWA C509 for resilient seated gate valves. The valve design shall incorporate non-rising

stems and "O" ring stem seals. Valves shall open counterclockwise. Valves shall be designed for bubbletight shutoff to flow in either direction. Before shipment, the valve manufacturer shall test each valve to 200 psi pressure differential in both directions and provide a certificate to the Engineer stating that each valve provided bubbletight shutoff during testing. The valve interior shall be epoxy coated on the entire ferrous surface of the waterway. The valve exterior shall be coated in accordance with Section 09900, Painting and Coating, and encased with polyethylene as specified in this Section for ductile-iron pipe and fittings. Buried valves shall be equipped with standard 2-inch-square operating nuts.

2. Buried valves 2 inches and larger shall have mechanical joint ends, conforming to AWWA C111/A21.11. Valves shall be furnished complete with bolts, nuts, and gaskets.
3. Gate valves shall be manufactured by Mueller, American Flow Control, Kennedy, or approved equal.

2.15 GLOBE AND ANGLE VALVES (TYPE 700 SERIES) (NOT USED)

2.16 PINCH (TYPE 800 SERIES) (NOT USED)

2.17 PLUG (TYPE 900 SERIES)

A. Plug and Seating Design for Eccentric Plug Valves (Type 920): Eccentric plug valves shall comply with MSS SP-108 and the following. Provide a rectangular plug design, with an associated rectangular seat. Provide bidirectional seating design. The valve shall seat with the rated pressure upstream and downstream of the closed plug. Provide geared actuators sized for bidirectional operation.

B. For Type 920 eccentric plug valves, the metallic portion of the plug shall be one-piece design and shall be without external reinforcing ribs which result in a space between the rib and the main body of the plug through which water can pass. Valves shall be repackable without any disassembly of valve or actuator. The valve shall be capable of being repacked while under the design pressure in the open position. Nowhere in the valve or actuators shall the valve shaft be exposed to iron-on-iron contact. Sleeve bearings shall be stainless-steel in valve sizes 20 inches and smaller and bronze or stainless-steel in valve sizes 24 inches and larger. Provide enclosed worm-gear actuators for valves 6 inches and larger.

C. Rubber compounds shall have less than 2% volume increase when tested in accordance with ASTM D471 after being immersed in distilled water at a temperature of 73.4°F ±2°F for 70 hours.

D. Type 920—Cast-Iron Non-Lubricated Eccentric Plug Valves, 4 Inches and Larger

1. Plug valves 4 inches and larger shall be of the non-lubricated eccentric type with resilient faced plugs and shall be furnished with flanges or mechanical-joint end connections to match connecting piping and as shown in the Drawings. Flanged valves shall be 125-pound flanges and faced and drilled to the ASME B16.1, 125-pound standard. Mechanical joint ends shall conform to AWWA C111/A21.11. Valve bodies shall be of ASTM A126 Class B cast-iron. Valves shall be furnished with a welded overlay seat of not less than 90% pure nickel. Seat area shall be raised, with raised surface completely covered with weld to ensure that the plug face contacts only nickel. Screwed-in seats shall not be acceptable. The plug shall have a cylindrical seating surface eccentrically offset from the center of the plug shaft. The interference between the plug face and body seat, with the plug in the closed position, shall be externally adjustable in the field with the valve in the line under pressure. Plugs shall be resilient faced with Hycar (Acrylonitrile-Butadiene) or Buna N, formulated and constructed to be suitable for use with wastewater. Minimum port areas shall be 80% of full pipe flow area. Valves shall have sleeve-type metal bearings and shall be of sintered, oil-impregnated, permanently lubricated Type 316 ASTM. Nonmetallic bearings shall not be acceptable. Valve shaft seals shall be of the multiple V-ring type or U-cup type and shall be externally adjustable and replaceable without removing the bonnet or actuator from the valve under pressure. Valves using O-ring seals or non-adjustable packing shall not be acceptable. All exposed nuts, bolts, springs, washers, and other fasteners shall be 300-series stainless-steel. Valve working pressure ratings shall be a minimum of 150 psi. Each valve shall be given a hydrostatic and seat test with certified copies of proof-of-design test reports as outlined in AWWA C504, Section 5.5. Plug valves shall be DeZurik PEC Series, Henry Pratt Company “Ballcentric” Series, or approved equal.

2.18 SOLENOID VALVES (TYPE 1000 SERIES) (NOT USED)

2.19 OTHER SPECIAL TYPES OF VALVES (TYPE 1100) (NOT USED)

PART 3 EXECUTION

3.01 JOINTS

A. Bolt holes of flanged valves shall straddle the horizontal and vertical centerlines of the pipe run to which the valves are attached. Clean flanges by wire brushing before installing flanged valves. Clean flange bolts and nuts by wire brushing, lubricate threads with oil and graphite, and tighten nuts uniformly and

progressively. If flanges leak under pressure testing, loosen or remove the nuts and bolts, reseat or replace the gasket, reinstall or retighten the bolts and nuts, and retest the joints. Joints shall be watertight.

B. Clean threaded joints by wire brushing or swabbing. Apply Teflon joint compound or Teflon tape to pipe threads before installing threaded valves. Joints shall be watertight.

C. Install lug-type valves with separate hex head machine bolts at each bolt hole and each flange (two bolts per valve bolt hole).

D. Install grooved-end couplings for valves in accordance with Section 15055, Piping Systems—General.

3.02 INSTALLING EXPOSED VALVES

A. Unless otherwise indicated in the Drawings, install valves in horizontal runs of pipe having centerline elevations 4 feet 6 inches or less above the floor with their operating stems vertical. Install valves in horizontal runs of pipe having centerline elevations between 4 feet 6 inches and 6 feet 9 inches above the floor with their operating stems horizontal.

B. Install valves on vertical runs of pipe that are next to walls with their stems horizontal, away from the wall. Valves on vertical runs of pipe that are not located next to walls shall be installed with their stems horizontal, oriented to facilitate valve operation.

3.03 INSTALLING BURIED VALVES

A. Connect the valve, coat the flanges, apply tape wrapping or polyethylene encasement as required on the Drawings, and place and compact the backfill to the height of the valve stem.

B. Place block pads under the extension pipe to maintain the valve box vertical during backfilling and repaving and to prevent the extension pipe from contacting the valve bonnet.

C. Mount the upper slip pipe of the extension in midposition and secure with backfill around the extension pipe. Pour the concrete ring allowing a depression so the valve box cap will be flush with the pavement surface.

D. In streets without concrete curbs and in open areas, install the valve box as for a paved area with concrete curb but include a marker post. Cut the marker post from 4-inch-by-4-inch dense structural grade Douglas fir No. 2 or Southern Pine

No. 2 surfaced on four sides to a length of 5 feet. Chamfer the top. Set the post in concrete, 2 feet into the ground, away from traffic, and to the side of the pipeline. Coat with a seal and finish coat of white alkyd exterior paint. On the side facing the valve, letter in black the word "VALVE" and the distance in feet from the marker post to the valve box cap.

E. Install debris cap as close as possible under the cast-iron cover without interfering with the cover operation. Trim flexible skirt to provide a smooth contact with the interior or the extension pipe.

3.04 INSTALLING EXTENSION STEM GUIDE BRACKETS

A. Install extension stem guide brackets at 6- to 8-foot centers. Provide at least two support brackets for stems longer than 10 feet, with one support near the bottom of the stem and one near the top.

3.05 FIELD COATING BURIED VALVES

A. Coat flanges of buried valves and the flanges of the adjacent piping and the bolts and nuts of flanges and mechanical joints, as specified in Section 09900, Painting and Coating, System No. 24.

B. Wrap buried metal valves 6 inches and larger with polyethylene sheet as specified in Section 15155, Ductile Iron Pipe and Fittings.

3.06 VALVE LEAKAGE AND FIELD TESTING

A. Test valves for leakage at the same time that the connecting pipelines are tested. See Section 15144, Pressure Testing of Piping, for pressure testing requirements. Protect or isolate any parts of valves, actuators, or control and instrumentation systems whose pressure rating is less than the pressure test. Valves shall show zero leakage. Repair or replace any leaking valves and retest.

B. Operate manual valves through three full cycles of opening and closing. Valves shall operate from full open to full close without sticking or binding. Do not backfill buried valves until after verifying that valves operate from full open to full closed. If valves stick or bind or do not operate from full open to full closed, repair or replace the valve and repeat the tests.

C. Test gear actuators through three full cycles from full-open to full-close without binding or sticking. The pull required to operate handwheel- or chainwheel-operated valves shall not exceed 80 pounds. The torque required to operate valves having 2-inch AWWA nuts shall not exceed 150 foot-pounds. If actuators stick or bind or if pulling forces and torques exceed the values stated previously, repair or

replace the actuators and repeat the tests. Operators shall be lubricated in accordance with the manufacturer's recommendations before operating.

WATER SERVICE CARD

Date of Installation _____

Contract Drawing Number_____

Service Line Size (inches) _____
Length of Water Service Line (feet) _____
Meter Size (inches) _____

Name _____
House/Business Address or Location:

_____
_____
_____

Phone # _____

GPS coordinate @ main _____
GPS coordinate @ meter _____
Confirm Photos are attached _____

Installation Foreman _____

Service Layout

Provide a brief sketch of the installed configuration. Indicate lengths, depths of the water service, and show three ties to meter box and to corporation stop:

Depth @ Main (feet) _____
Depth @ stub out (feet) _____

_____ _____
Contractor Signature Resident Observer Signature

(Rev 2 – 15 Oct 2006)

END OF SECTION

SECTION 15121
MISCELLANEOUS PIPE FITTINGS AND ACCESSORIES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section describes requirements for materials and installation of miscellaneous piping specialties, such as quick-connect couplings and flanged coupling adapters.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Submit manufacturer's catalog data and descriptive literature showing dimensions and materials of construction by ASTM reference and grade. Show coatings.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Iron and Steel Institute (AISI)

1. AISI C1012—Specification for Hard-Drawn Low-Carbon Steel.

B. American Society for Testing and Materials (ASTM)

1. ASTM A36/A36M—Standard Specification for Carbon Structural Steel.
2. ASTM A240/A240M—Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
3. ASTM A513/A513M—Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
4. ASTM A536—Standard Specification for Ductile Iron Castings.
5. ASTM A635/A635M—Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Hot-Rolled, Alloy, Carbon, Structural, High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability, General Requirements for.

6. ASTM C219—Standard Terminology Relating to Hydraulic Cement.
7. ASTM D2000—Standard Classification System for Rubber Products in Automotive Applications.

C. American Society of Mechanical Engineers (ASME)

1. ASME B16.1—Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250.
2. ASME SA36—Carbon Steel Shapes, Plates, and Bars of Structural Quality for Use in Riveted, Bolted, or Welded Construction.
3. ASME SA675— Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties (Carbon Steel Middle Ring or Sleeve).

D. American Water Works Association (AWWA)

1. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
2. AWWA C213—Fusion-Bonded Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
3. AWWA C219—Bolted Sleeve-Type Couplings for Plain-End Pipe.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 METALLIC QUICK-CONNECT COUPLINGS

A. Type 6: Quick-connect couplers shall be female-coupler/female-thread type with locking handles. Provide dust plug and security chain with each coupler. Bodies

and locking handles shall be Type 316 stainless steel. The gasket shall be Teflon. Couplers shall be CIVACON Kamlok 633-D/634-A, Evertite Part D/DP, or equal.

B. Type 8: Quick-connect couplers shall be male-adapter/female-thread type. Provide dust cap and security chain with each coupler. Bodies and locking handles shall be Type 316 stainless steel. The gasket shall be Teflon. Adapters shall be CIVACON Kamlock 633-A/634-B, Evertite Part A/DC, or equal.

C. Type 10: Quick-connect couplers shall be male-adapter/hose-shank type. Provide dust cap with each coupler. Bodies and dust caps shall be Type 316 stainless steel. The gasket shall be Teflon. Adapters shall be CIVACON Kamlok 633-E/634-B, Evertite Part C/DC, or equal.

2.02 COUPLINGS FOR METALLIC PIPING

A. General

1. Thrust Ties: The Contractor shall provide thrust ties where shown and where required to restrain the force developed by 12 times the maximum operating pressure specified.

    a. Steel Pipe: Attach with fabricated lugs.
    b. Ductile Iron Pipe: Attach with bell hanger and wedge restraint glands for buried mechanical joint and push-on joint piping; and thrust retention plates and tie-rods, nuts, washers, and bolts for exposed, flanged piping.

2. Exposed Installations: Zinc-plated nuts and bolts. High-strength, low-alloy steel, in accordance with AWWA C111/A21.11, may be substituted for use on cast-iron and ductile-iron couplings.

3. Buried and Submerged Installations: Provide Type 304 stainless steel tie rods, bolts, and nuts and assemble with an anti-galling compound.

4. Steel Middle Rings and Followers: Fusion-bonded epoxy-lined and coated in accordance with AWWA C213.

5. Restrained couplings or other fittings that use set screws, pointed-end screws to penetrate the outside surface of the pipe for restraint are not acceptable.

B. Flexible Couplings: Coupling shall consist of a steel middle ring or sleeve, two steel or malleable iron flange or follower rings, two wedge-shaped resilient gaskets, and a sufficient number of track-head bolts and nuts.

1. Middle Ring or Sleeve: Steel construction, ASTM A513/A513M, ASTM A635/A635M, or ASME SA675 GR60, fabricated in a true circular section and free of surface defect.

2. Follower Rings or Flanges: Steel construction, AISI C1012 or ASME SA36, fabricated in a true circular section and free of surface defect.

3. Bolts and Nuts: Steel bolt, AWWA C111/A21.22.

4. Gaskets: Grade 27 BUNA-S.

5. Shop Paint: Fusion-bonded epoxy coating.

6. Acceptable Manufacturers:

   a. Dresser Manufacturing Division of Dresser Industries, Inc.
   b. Dresser Styles 38 and 138.
   c. Or approved equal.

C. Transition Couplings: Transition Coupling shall consist of a high-strength steel body, two steel or malleable iron flange or follower rings, a wedge shaped resilient gasket, and a sufficient number of follower bolts.

1. Adapter: Steel construction, ASTM A513/A513M, ASTM A635/A635M or ASME SA675 GR60, free of surface defect.

2. Followers: AISI C1012 or ASME SA36.

3. Bolts: AWWA C 111/ANSI A21.11.

4. Gasket: Grade 27 BUNA-S.

5. Shop Paint: Fusion-bonded epoxy coating.

6. Acceptable Manufacturers:

   a. Dresser Manufacturing Division of Dresser Industries, Inc.; Dresser Styles 62 and 162.
   b. Or approved equal.

D. Flanged Coupling Adapters: Adapters shall consist of a cast-iron or high-strength steel body, two steel or ductile-iron follower rings, a wedge shaped resilient gasket, and a sufficient number of follower bolts.

1. 3- through 12-inch DIP Flange Adapters

a. Adapter: Ductile iron construction, ASTM A536, Grade 65-45-12, free of surface defect. Adapter shall be rated to 200 psi working pressure in accordance with AWWA C219, and -20°F to 212°F.

b. Flanges: Ductile iron construction, ASTM A536, Grade 65-45-12, free of surface defect. Bolt circles and bolt holes shall match those of ASME B16.1 Class 125 flanges.

c. Bolts and nuts: Corrosion-resistant alloy bolts and nuts.

d. Gasket: Grade 27 BUNA-S.

e. Shop paint: fusion-bonded powder epoxy coating.

f. Acceptable Manufacturers:

(1) Dresser Manufacturing Division of Dresser Industries, Inc.; Dresser Style 127.
(2) Or Equal.

2.03 BOLTED SPLIT-SLEEVE AND SINGLE- POINT CLOSURE COUPLINGS

A. Bolted, split-sleeve, and single-point closure couplings shall meet the materials and performance conforming to AWWA C219, which shall be used for steel pipe and stainless steel pipe.

B. When the connecting piping is carbon steel, the coupling shall be manufactured from ASTM A36/A36M carbon steel. When the connecting piping is stainless steel, the coupling shall be manufactured from ASTM A240/A240M Type 316/316L stainless steel.

C. The coupling shall be of the split type with a single-point closure coupling. Provide welded restraint rings on the pipe ends for end restraint. As the coupling closes, it shall confine an elastomeric o-ring type gasket on each pipe end to create a radial seal. The axial seal shall be affected at the closure plates as bolts pull the coupling snug round the pipe.

D. The coupling manufacturer shall provide the restraint rings for each coupling. The Contractor's fabricator shall weld the restraint rings to the pipe in strict accordance with the coupling manufacturer's recommendations.

E. For water service, the elastomeric o-ring type gaskets shall be EPDM (or other material accepted by the Engineer) conforming to ASTM D2000 for the design pressure for the temperature range of -20°F to 180˚F.

F. Type C201 shall be a shouldered, bolted, split-sleeve, fully restrained coupling. Type C201 coupling shall be Depend-O-Lok F x F (Fixed x Fixed), Type 2 manufactured by Victaulic, Depend-O-Lok, Inc., or approved equal.

G. Type C202 shall be a shouldered, bolted, split-sleeve, fully restrained coupling that allows angular deflection of the connecting pipes. Type C202 coupling shall be Depend-O-Lok F x F (Fixed x Fixed), Type 2, Modified manufactured by Victaulic, Depend-O-Lok, Inc., or approved equal.

PART 3 EXECUTION

3.01 INSTALLING QUICK-CONNECT COUPLINGS

A. Attach to piping in accordance with the relevant piping specification.

3.02 INSTALLING COUPLINGS

A. Pipe for use with flexible couplings shall have plain ends as specified in the respective pipe sections in Division 15, Mechanical.

B. Alloy steel bolts and nut for flanged joints shall be made with high-strength, low-alloy Cor-Ten bolts, nuts, and washers. Cor-Ten for mechanical joints shall be made with mild corrosion resistant alloy steel bolts and nuts. All exposed bolts shall be painted the same color as the pipe. All joints to be wrapped with 8-mil color-coded poly wrap.

C. Before sleeve-type couplings are installed, the pipe ends shall be cleaned thoroughly for a distance of 8 inches. Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6 inches from the end, and the middle ring shall be placed on the substantial completion date unless otherwise requested by the Owner.

D. Mechanical joints shall be made in the standard manner. Valve stems shall be vertical in all cases. Set cast-iron box as shown on the Drawings. Boxes shall have sufficient bracing to maintain alignment during backfilling. Knobs on cover shall be parallel to pipe. Remove any sand or undesirable fill from valve box after

installation. Extend tracing wire outside of valve box extension pipe and enter at valve box.

E. Thoroughly clean oil, scale, rust, and dirt from the pipe to provide a clean seat for the gasket.

F. Wipe gaskets clean before installations.

G. Lubricate flexible couplings and flanged coupling adapter gaskets with soapy water or manufacturer's standard lubricant before installing on the pipe ends.

H. Install couplings, service saddles, and anchor studs in accordance with the manufacturer's instruction.

I. Tighten bolts progressively, drawing up bolts on opposite sides a little at a time until all bolts have a uniform tightness.

J. Use torque-limiting wrenches to tighten bolts to the manufacturer's specified torque values.

END OF SECTION

SECTION 15125
PIPING APPURTENANCES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all piping appurtenances as shown on the Drawings and as specified in this Section.

B. All piping appurtenances shall be of the size shown on the Drawings. All equipment of the same type shall be from one manufacturer, unless authorized in writing by the Engineer.

C. All piping appurtenances shall have the name of the manufacturer and the working pressure for which they are designed cast in raised letters upon the body.

D. The piping appurtenances shall include, but not be limited to, the following:

1. Tapping Saddles.
2. Tapping Sleeves and Valves.
3. Pressure Gauge Assembly.
4. Fire Hydrant.
5. Water Meter.
6. Strainers.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product technical submittal data shall contain the following information and data:

1. Acknowledgment that products submitted meet requirements of standards referenced.

2. Manufacturer’s installation instructions.

3. Expansion joints, flexible joints, couplings, adaptors, tapping sleeves, and other appurtenances:

a. Pressure and temperature rating.

b. Materials of construction.
c. Linings.
d. Dimensions and weight.
e. Accessories.
f. Manufacturer's product brochures, cut-sheets, and parts diagrams.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Iron and Steel Institute (AISI)

1. AISI Type 304L—Stainless Steel.
2. AISI Type 316—Stainless Steel, Annealed Sheet.

B. American Society for Testing and Materials (ASTM)

1. ASTM A536—Standard Specification for Ductile Iron Castings.
2. ASTM C285—Standard Test Methods for Sieve Analysis of Wet-Milled and Dry-Milled Porcelain Enamel.

C. American Society of Mechanical Engineers (ASME)

1. ASME B16.5—Pipe Flanges and Flanged Fittings NPS 1/2 through NPS 24 Metric/Inch Standards.

D. American Water Works Association (AWWA)

1. AWWA C105/A21.5—Polyethylene Encasement for Ductile-Iron Pipe Systems.
2. AWWA C153/A21.53—Ductile-Iron Compact Fittings.
3. AWWA C207—Steel Pipe Flanges for Waterworks Service, Sizes 4-Inch through 144-Inch (100 mm through 3,600 mm).
4. AWWA C210—Liquid-Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
5. AWWA C213—Fusion-Bonded Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
6. AWWA C500—Metal-Seated Gate Valves for Water Supply Service.
7. AWWA C502—Dry-Barrel Fire Hydrants.

8. AWWA C700—Standard for Cold-Water Meters—Displacement Type, Metal Alloy Main Case.
9. AWWA C800—Underground Service Line Valves and Fittings.

E. National Sanitation Foundation (NSF)

1. NSF 61—Drinking Water System Components – Health Effects.

1.04 DELIVERY, HANDLING, AND STORAGE

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. All piping appurtenances, unless otherwise directed, shall be loaded and unloaded by lifting, and under no circumstances shall any piping appurtenances be dropped, skidded, or rolled.

C. Slings, hooks, or tongs used for lifting shall be padded to prevent damage to exterior surface or interior linings of piping appurtenances. If any part of the coating, lining, or components is damaged, the Contractor shall make repairs or replacement at his expense and in a manner satisfactory to the Engineer before attempting to install such piping appurtenances.

D. Only new piping appurtenances will be allowed for installation and shall be stored to prevent damage and be kept free of dirt, mud, or other debris.

1.05 QUALIFICATIONS

A. All of the piping appurtenances shall be products of well-established firms that are fully experienced, reputable, have been selling this product for a minimum of 10 years, and qualified in the manufacture of the particular product furnished. The piping appurtenances shall be designed, constructed, and installed in accordance with the requirements and procedures of applicable AWWA standards and shall comply with these Specifications as applicable.

PART 2 PRODUCTS

2.01 TAPPING SADDLE

A. Saddle body shall be made of malleable iron, ductile iron, or bronze. Malleable iron and ductile iron shall be epoxy or nylon coated. Saddles shall be of the single- or multiple-strap design (multiple straps are required for sizes 10 inches and above). The straps shall be made from Type 304 stainless steel or bronze. The

straps shall have a nominal width of 2 inches. Strap studs shall be made from AISI Type 304L stainless steel.

B. Nuts and washers shall be made from Type 304 stainless steel and shall be treated to prevent galling. The straps shall have a curvature accurately formed to meet the diameter of the pipe on which the service saddle is to be installed. A Neoprene gasket shall be securely glued to or imbedded in the body of the clamp to ensure positive sealing against the pipe. Outlet sizes of 3/4 inch and 1 inch shall have female C.C. thread while the outlet for 1-1/2 inches and 2 inches shall be female I.P. thread.

C. Tapping saddles shall not be used on HDPE due to expansion and contraction problems unless specifically approved in writing by the Engineer on a case-by-case basis.

2.02 TAPPING SLEEVES AND VALVES

A. Tapping sleeves and valves shall be designed for a minimum water working pressure of 150 psi and shall be tested at 300 psi. The design shall allow for the insertion of bolts from either side and the internal seal is to be the "O-ring" type. The tapping sleeve shall be furnished complete with bolts, nuts, and gaskets.

B. With the exception of the valve ends and other modifications necessary for tapping service, tapping valves shall conform to AWWA C500 and shall be Mueller "No. T-2360" or approved equal. Each tapping valve shall be provided with a flanged inlet end designed, faced, and drilled for attachment to the outlet flange of the tapping sleeve; an outlet end provided with a tapping flange for attachment of a standard drilling machine; and a mechanical-joint-type bell end for connection of the branch main.

C. Tapping sleeves for 4-inch- through 24-inch-diameter pipe shall be epoxy-coated fabricated-steel construction and manufactured to meet material specification ASTM C285 Grade C for the body. The flange shall conform to AWWA C207 Class D and have an ANSI 150-pound drilling and recessed for tapping valve.

D. Tapping sleeves shall be of the flanged outlet type designed for attachment to the flanged inlet end of the tapping valve and shall be provided with mechanical joint ends at each end of the run. Tapping sleeves shall be Mueller "No. H-615" or approved equal.

2.03 PRESSURE-GAUGE ASSEMBLY

A. Pressure-gauge assemblies shall be provided at locations listed below or as shown on the Drawings. All pressure-gauge assemblies shall include a pressure gauge,

AISI Type 316 stainless steel, NPT threaded ball valves for isolation and venting, and sensor piping. Sensor piping tubing and fittings shall be Type 316 stainless steel. The pressure gauge shall be constructed of Type 316 stainless-steel wetted parts and Type 304 stainless-steel case and bayonet ring, adjustable pointer, laminated safety-glass window, glycerin liquid-filled case, 1.5% span accuracy, and shall have a 2.5-inch-diameter dial size, minimum. The pressure gauge shall be as manufactured by WIKA Instrument Corporation, Type LM 233.54, or approved equal.

B. The Contractor shall furnish and install pressure-gauge assemblies with pressure-gauge ranges as follows and/or shown on the Drawings.

2.04 FIRE HYDRANT

A. Fire hydrants shall be in accordance with AWWA C502, for dry barrel-type fire hydrants. Fire hydrants shall meet the following requirements:

Catalogue and maintenance data	Required.
Type of shutoff	Gate.
Size of hydrant (valve opening)	6-inch.
Inlet connection	6-inch, verify with Drawings.
Outlet nozzles	Two 2.5-inch hose and one 4.5-inch pumper.
Outlet nozzle threads	See Note 1.
Direction to open	Counterclockwise.
Stem seals	O-ring.
Outlet nozzle cap chains	Required.
Drain outlet, non-corrodible	Required.
Traffic breakaway body and valve rod	Required.
Working pressure rating	200 psi (minimum).
Fire hydrant wrenches	Provide five wrenches as spare parts.
Nozzle wrenches	Provide five wrenches as spare parts for each size nozzle provided.
Breakaway repair kit	Provide five kits as spare parts.

Notes

1. Outlet nozzle threads shall be the Owner's standard fire hydrant thread. The Contractor shall verify thread type before submittal.

B. Hydrants shall have Underwriter's Laboratory (UL) and Factory Mutual (FM) approvals. Hydrant exteriors shall be painted with one coat of zinc-chromate alkyd primer and two finish coats of approved paint of the color required by the Owner. Hydrant interiors shall be painted with a paint system approved by NSF

for use in potable water. Working parts shall be bronze. All internal parts shall be removable through the top of the hydrant. Hydrants shall conform to NFPA 24.

C. Fire hydrant extensions shall be provided at no additional cost to the Owner to meet final grade requirements. All hydrants shall stand plumb. No portion of the fire hydrant shall be within 6 inches of a sidewalk. After installation, all hydrants shall be inspected, cleaned, and opened and closed as many times as required to verify that all aspects of the hydrant work properly.

D. Fire hydrants shall be American Darling FHA B-84-B, or equal.

2.05 WATER METER

A. Water meters through 2-inch diameter shall comply with AWWA C700 and NSF 61 standards. Water meters through 6-inch diameter shall comply with AWWA C715 and NSF 61 standards. The meter housing, bottom plates, and trim shall be bronze. The measuring chamber, disc, strainer, generator housing, register lid, and shroud shall be thermoplastic. The magnet shall be ceramic. The disc and magnet spindles shall be stainless steel. External bolts shall be non-corrosive metal.

B. Water meters shall be rated for continuous operation and have a maximum operating pressure of 150 psi. The measuring element shall be a positive displacement mutating disc. An oscillating piston-type meter is not acceptable. The sealed register shall consist of a straight reading, odometer-type totalizing display with a 10,000,000-gallon capacity (minimum) for meters smaller than the 1.5-inch unit and a 100,000,000-gallon capacity (minimum) for the 1.5-inch meter and larger, 360º test circle with center sweep hand, and flow finder to detect leaks. All meters shall have rigid, non-ferrous strainers that are easily removable and have an effective straining area of double that of the main-case inlet.

C. The meters shall have the following minimum characteristics:

Meter Size (inches)	Minimum Test Flow	Normal Test Flow Limits	Pressure Loss @AWWA Max. Cap.	Laying Length (inches)
5/8 x 3/4	1/4 gpm	1/2 – 20 gpm	5.0 psi	7-1/2
3/4 x 3/4	3/8 gpm	3/4 – 30 gpm	7.5 psi	7-1/2 (only)
1	3/4 gpm	1-1/4 – 50 gpm	7.0 psi	10-3/4
1-1/2	1-1/4 gpm	2-1/2 – 100 gpm	7.5 psi	12-5/8 or 13
2	1-1/2 gpm	2-1/2 – 160 gpm	9.0 psi	15-1/4 or 17
6	9 gpm	40 – 800 gpm	2.0 psi	18

D. Water meters up to 2 inches in diameter shall be Badger Recordall Model, Neptune, or approved equal. Water meters greater than 6” in diameter shall be Neptune Mach 10 Ultrasonic or approved equal. Headloss through the meter shall not exceed the published headloss through the named meters at any point on the headloss curve.

E. Water meters larger than 1 inch shall have flanges for inlet and outlet connections; other water meters shall have threaded male inlet and outlet. All meters shall be easily removed from the installed piping.

2.06 STRAINERS

A. Strainers shall be installed where indicated on the Drawings and as specified in this Section. Unless specified otherwise, strainers shall be Y-pattern units with flanged ends and cap, brass or cast-iron body, and stainless steel screens. Screens shall have 40-mesh perforations. Strainers shall be Neptune or approved equal. The blow off from each strainer shall be equipped with a shutoff valve. Blow-down shutoff valves 3/4-inch and smaller shall be provided with male threaded hose adapters. Strainers upstream from double mechanical pump seals shall have 80-mesh screens.

B. A strainer installed in piping immediately upstream from a solenoid valve in water service shall be a Y-pattern unit with brass or bronze body and monel or stainless steel screen. Strainers shall be Neptune or approved equal. The blow off from each strainer shall be equipped with a shutoff valve.

C. A strainer installed in piping immediately upstream from each 2-inch or smaller pressure-reducing valve shall be a Y-pattern unit with bronze, brass, or cast-iron body and monel or stainless steel screen. Strainers shall be Neptune or approved equal. Strainers installed in copper piping shall be of bronze or brass construction. The blow off from each strainer shall be equipped with a shutoff valve.

2.07 TOOLS

A. If required for normal operation and maintenance, special tools shall be supplied with the equipment. Two T-handle wrenches to operate standard 2-inch nuts on buried valves and buried valve actuators shall be provided as part of the work.

PART 3 EXECUTION

3.01 INSTALLATION

A. The Contractor shall install all piping appurtenances as shown on the Drawings.

B. All piping appurtenances shall be installed in the location shown, unless approved otherwise, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the Owner and the Engineer.

C. Install concrete inserts for hangers and supports as soon as forms are erected and before concrete is poured. Before setting these items, the Contractor shall check all plans and figures which have a direct bearing on their location and shall be responsible for the proper location of these piping appurtenances during the construction of the structures.

3.02 SHOP PAINTING

A. Exterior surfaces of ferrous valves and piping appurtenances shall be painted in accordance with Section 09900, Painting and Coating, unless noted or specified otherwise.

3.03 INSPECTION AND TESTING

A. Completed valves and piping appurtenances shall be subjected to hydrostatic pressure test as described in Section 15055, Piping Systems—General, and the detail pipe sections of these Specifications. All leaks in valves and piping appurtenances shall be repaired and lines retested as approved by the Engineer. Before testing, the valves and pipelines shall be supported and thrust restrained for forces in excess of the test pressure to prevent movement during tests.

END OF SECTION

SECTION 15141
DISINFECTION OF PIPING AND WATER STORAGE FACILITIES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section describes requirements for materials and procedures for disinfecting water mains by the continuous feed method and the slug method as well as for disinfecting water storage facilities. The Contractor shall disinfect piping in accordance with Rule 62-555.340, FAC, and AWWA C651 and disinfect water storage facilities in accordance with Rule 62-555.340, FAC, and AWWA C652, except as modified below.

B. Use potable water for chlorination.

C. Submit request for use of water from waterlines of the Owner at least 48 hours in advance.

D. If water for disinfection and/or flushing is supplied from a temporary connection to the existing distribution system, appropriate backflow prevention methods shall be used.

E. Proper disposal of the chlorinated disinfection water and the flushing water is the Contractor's responsibility. Disinfected water shall be neutralized in accordance with AWWA C651 and C652 before discharge.

F. Before permit review and coordination with the Owner and appropriate regulatory authorities (i.e., FDEP and Pasco County Health Department), the Contractor shall provide a schedule for the rate of flow and locations of discharges for the disinfection of piping and water storage facilities. The neutralized discharge water shall be disposed of by discharging to the nearest sanitary sewer (check with the Owner) to the local stormwater system through on-site swales or by other approved means. Discharge to the local stormwater system shall be routed to avoid swale overflow and/or erosion. The Contractor shall be responsible for any damage that occurs related to the discharging process. The Contractor shall repair or replace any damage caused by discharging to the Owner’s satisfaction at no additional expense to the Owner.

G. It is the responsibility of the Contractor to implement and enforce strict adherence to safety guidelines which are addressed in AWWA C651 and C652 as well as safety and handling instructions from the manufacturer. The Contractor shall

comply with all applicable national, state, and local safety regulations and requirements, including OSHA.

1.02 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Water Works Association (AWWA)

1. AWWA B300—Hypochlorites.
2. AWWA B301—Liquid Chlorine.
3. AWWA C651—Disinfecting Water Mains.
4. AWWA C652—Disinfection of Water – Storage Facilities.

B. Florida Administrative Code (FAC)

1. FAC 62-555.340—Disinfection and Bacteriological Evaluation of Public Water System Components.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.05 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 LIQUID CHLORINE

A. Liquid chlorine shall conform to AWWA B301 and shall be applied in strict accordance with AWWA C651 and AWWA C652.

2.02 CALCIUM HYPOCHLORITE (DRY)

A. Calcium hypochlorite shall conform to AWWA B300 and shall be applied in strict accordance with AWWA C651 and AWWA C652. Calcium hypochlorite intended for swimming pool chlorination shall not be used under any circumstances.

2.03 SODIUM HYPOCHLORITE (SOLUTION)

A. Sodium hypochlorite shall conform to AWWA B300 and shall be applied in strict accordance with AWWA C651 and AWWA C652.

2.04 CHLORINE RESIDUAL TEST KIT

A. For measuring chlorine concentration, the Contractor shall supply and use a medium-range, drop count, DPD drop dilution method kit in accordance with AWWA C651 and AWWA C652. Maintain kits in good working order available for immediate test of residuals at point of sampling.

PART 3 EXECUTION

3.01 GENERAL DISINFECTION PROCEDURE

A. Before disinfection, the Contractor shall inspect materials for quality. The Contractor shall use materials and equipment that are appropriate for the disinfection methods selected. The Contractor shall observe the precautionary guidelines given in AWWA C651 and C652.

B. During construction, the Contractor shall take preventative measures in accordance with AWWA C651 to protect materials from contamination.

C. Hydrostatic testing shall be successfully performed before disinfection.

D. Before disinfection, the Contractor shall clear water mains and water storage facilities of foreign debris:

1. Pipelines which are less than 24 inches in diameter shall be flushed, while pipelines which are greater than 24 inches in diameter may be cleared via broom-sweeping in accordance with AWWA C651 and as specified in Section 15144, Pressure Testing of Piping. Sweepings shall be removed from pipeline before the disinfection process begins.
2. Water storage facilities shall be cleared of all materials that are not part of the structural or operating facilities of the tank and shall be cleared of all

debris in accordance with AWWA C652. After the water storage facility has been cleaned, all screened openings shall be inspected for quality of materials and adequate condition to prevent the entry of insects, birds, and other possible contaminants into the tank. The Contractor shall properly disinfect any materials that enter the tank after cleaning in accordance with AWWA C652 before placement in the tank.

E. In accordance with AWWA C651 and C652 procedures, the Contractor shall disinfect all newly constructed materials and existing materials which may have been contaminated during construction. The Contractor shall provide adequate documentation that the required disinfection level (i.e., required chlorine residual and contact time) was successfully achieved.

F. In accordance with Rule 62-555.340, FAC, following disinfection the total chlorine residual in the water mains and water storage facilities shall be reduced to 4 mg/L. The chlorine residual may be reduced via flushing with potable water or by a neutralizing agent that conforms to AWWA C651 and C652.

G. After the total chlorine residual has been reduced to 4 mg/L, the Contractor shall conduct bacteriological testing for water mains and water storage facilities. Bacteriological sampling and testing shall be performed in accordance with Rule 62-555.340, FAC.

H. The Contractor shall dispose of residue from cleaning and other construction operations as well as water from dewatering operations in a manner satisfactory to FDEP and the Pasco County Health Department.

3.02 CONTINUOUS-FEED METHOD FOR PIPELINES

A. Continuous-feed disinfection shall be performed in accordance with AWWA C651. The Contractor shall introduce potable water into the pipeline at a constant measured rate. Feed the chlorine solution into the same water at a measured rate. Proportion the two rates so that the free chlorine concentration in the pipeline is maintained at a minimum concentration of 25 mg/L. Inject chlorine into the main at a point no greater than 3 feet downstream of the start of the new water main. Using the appropriate test kits specified by AWWA C651, the Contractor shall check the concentration at points downstream during the filling to ascertain that sufficient chlorine is being added. The water main shall be completely filled with chlorinated water. The chlorine contact time shall be at least 24 hours. The water shall be chlorinated so that after 24 hours the concentration of free chlorine residual in the water main shall be not less than 10 mg/L.

3.03 SLUG METHOD FOR PIPELINES

A. The Contractor shall perform slug method disinfection in accordance with AWWA C651. Introduce the water in the pipeline at a constant measured rate. At a point no greater than 3 feet downstream of the start of the new water main, feed the chlorine solution into the pipeline at a measured rate so that the free chlorine concentration created in the pipeline is 100 mg/L. Using the appropriate test kits specified by AWWA C651, the Contractor shall check the concentration at points downstream during the filling to ascertain that sufficient chlorine is being added. Feed the chlorine for a sufficient period to develop a solid column or "slug" of chlorinated water that will, as it passes through the line, expose all interior surfaces to a concentration of at least 100 mg/L for at least 3 hours.

3.04 DISINFECTION OF VALVES, BLIND FLANGES, AND APPURTENANCES

A. During the period that the chlorine solution is in the pipeline or as the slug comes into contact with hydrants and valves, open and close valves at least three times to obtain a chlorine residual at hydrants and other pipeline appurtenances. Swab exposed faces of valves and blind flanges before bolting flanges in place with a 1% sodium hypochlorite solution.

3.05 DISINFECTION OF CONNECTIONS TO EXISTING PIPELINES

A. The Contractor shall disinfect isolation valves, pipe, and appurtenances in accordance with AWWA C651, Section 4.7. Flush with potable water until discolored water, mud, and debris are eliminated. Swab interior of pipe and fittings with a 1% sodium hypochlorite solution. After disinfection, flush with potable water again until water is free of chlorine odor.

3.06 CONFIRMATION OF RESIDUAL

A. After the chlorine solution applied by the continuous feed method has been retained in the pipeline for 24 hours, the Contractor shall confirm that a free chlorine residual of 10 mg/L minimum exists along the pipeline by sampling at air valves and other points of access, such as tapping valves.

B. With the slug method, confirm by sampling as the slug passes each access point and as it leaves the pipeline that the free chlorine concentration in the slug is at least 50 mg/L. If the free chlorine residual is less than 50 mg/L, the flow shall be stopped and the slug residual concentration shall be increased to 100 mg/L before disinfection may resume.

3.07 PIPELINE FLUSHING

A. After confirming the free chlorine residual and sufficient contact time, the Contractor shall flush the excess chlorine solution from the pipeline until the free chlorine concentration in the water leaving the pipe is no higher than 4 mg/L.

3.08 BACTERIOLOGICAL SAMPLING AND TESTING

A. In accordance with Rule 62-555.340, FAC, the Contractor shall collect and deliver required samples to a certified laboratory and obtain a bacteriologic quality test to demonstrate the absence of coliform organisms in each separate section of the pipeline and in each structure after chlorination and refilling. Samples shall be delivered to a certified laboratory within 6 hours of sampling:

1. For water mains, collect at least one set of samples from every 1,200 feet of the new water main, plus one set from the end of the line and at least one set from each branch. At each connection to an existing pipeline, take two additional samples.
2. The Contractor shall take care in the sampling of water storage facilities to ensure that the water sampled is representative of the facility. To obtain a representative sample, the storage facility shall be sampled from a tap connected directly to the storage facility or at a sample tap located on the outlet piping.

B. The Contractor shall take chlorine residual samples at the time bacteriological samples are taken. If the chlorine residual is greater than 4 mg/L, the bacteriological test shall be considered invalid and the residual shall be reduced to 4 mg/L and the bacteriological testing shall be performed until the required criteria are satisfied.

C. In accordance with AWWA C652, the Contractor shall test the water in the storage facility to ensure that no offensive odor has been imparted from the disinfection process.

3.09 REPETITION OF PROCEDURE

A. If the initial chlorination fails to produce required residuals and bacteriologic tests, the Contractor shall repeat the chlorination and testing until satisfactory results are obtained.

B. If the water main is installed before satisfactory bacteriological results are achieved, a precautionary boil water notice must be issued if recommended by the water supplier or if recommended by the Florida Department of Health's

"Guidelines for the Issuance of Precautionary Boil Water Notices" in accordance with Rule 62-555.340, FAC.

3.10 TEST FACILITY REMOVAL

A. After satisfactory disinfection, the Contractor shall disinfect and replace air valves, restore the pipe coating, and complete the pipeline where temporary disinfection or test facilities were installed.

3.11 PIPING TO BE DISINFECTED

A. Disinfect all piping as indicated on the Piping Schedule on the Drawings.

3.12 DISINFECTION OF STRUCTURES (NOT USED)

END OF SECTION

SECTION 15144
PRESSURE TESTING OF PIPING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section specifies the hydrostatic, pneumatic, and leakage testing of pressure piping for pumping stations, wastewater treatment plants, water treatment plants, and other facilities; water distribution and transmission mains; and raw sewage force mains and lift stations.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Test bulkhead locations and design calculations, pipe attachment details, and methods to prevent excessive pipe wall stresses.

B. Six copies of the test records to the Engineer upon completion of the testing.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Water Works Association (AWWA)

1. AWWA C600—Installation of Ductile Iron Mains and Their Appurtenances.
2. AWWA C605—Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings.
3. AWWA C906—Polyethylene (PE) Pressure Pipe and Fittings, 4-Inch through 63-Inch (100 mm through 1,650 mm), for Waterworks.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 TEST PRESSURES

A. Test pressures for the various services and types of piping are shown in the Piping Schedule in the Drawings. At a minimum, the Contractor shall perform pressure and leakage test at 1.5 times the maximum system pressure or 100 psi, whichever is greater (based on the elevation or the lowest point of the section under test and corrected for gage location).

1.07 TESTING RECORDS

A. The Contractor shall provide records of each piping installation during the testing. These records shall include the following information:

1. Date and times of test.
2. Identification of process, pipeline, or pipeline section tested or retested.
3. Identification of pipeline material.
4. Identification of pipe specification.
5. Test fluid.
6. Test duration.

B. Test pressure at low point in process, pipeline, or pipeline section.

C. Remarks: Leaks identified (type and location), types of repairs, or corrections made.

D. Certification by the Contractor that the leakage rate measured conformed to the Specifications.

1.08 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 VENTS AND DRAINS FOR ABOVEGROUND PIPING

A. The Contractor shall install vents on the high points of aboveground piping, whether shown in the Drawings or not. Install drains on low points of aboveground piping, whether shown in the Drawings or not. Provide a valve at each vent or drain point. Valves shall be 3/4 inch for piping 3 inches and larger and 1/2 inch for piping smaller than 3 inches. Valves shall be ball or gate valves unless otherwise shown on the Drawings. Valves shall be rated for the pressure of the adjacent piping and shall be suitable for use with the adjacent pipe material.

2.02 MANUAL AIR-RELEASE VALVES FOR BURIED PIPING

A. The Contractor shall provide temporary manual air-release valves at test bulkheads for pipeline test. Construct the pipe outlet in the same manner as for a permanent air valve and, after use, seal with a blind flange, pipe cap, or plug and coat the same as the adjacent pipe.

2.03 TEST BULKHEADS

A. The Contractor shall design and fabricate test bulkheads in accordance with Section VIII of the ASME Boiler and Pressure Vessel Code. Materials shall comply with Part UCS of the code. Design pressure shall be at least 2.0 times the specified test pressure for the section of pipe containing the bulkhead. Limit stresses to 70% of yield strength of the bulkhead material at the bulkhead design pressure. Include air-release and water drainage connections.

2.04 TESTING FLUID

A. The Owner will provide a source of supply from the existing treated water distribution system for the Contractor’s use in filling the lines. An air-break shall be maintained at all times between the Owner’s distribution system and the Contractor’s equipment to prevent cross-connection. The line shall be slowly filled with water and the specified test pressure shall be maintained in the pipe for the entire test period by means of a pump furnished by the Contractor. Provide accurate means for measuring the quantity of water required to maintain this pressure. The amount of water required is a measure of the leakage.

B. Testing fluid shall be potable water unless a pneumatic test is indicated on the Piping Schedule.

C. For fuel oil piping, use potable water for hydrostatic testing and flushing.

D. For potable water pipelines, obtain and use only potable water for hydrostatic testing.

E. Submit request for use of water from waterlines of the Owner 48 hours in advance.

F. The Contractor shall provide back flow prevention control for temporary connections to existing water mains.

2.05 TESTING EQUIPMENT

A. The Contractor shall provide calibrated pressure gauges, pipes, bulkheads, pumps, compressors, chart recorder, and meters to perform the hydrostatic testing. The Contractor shall provide any necessary assistance required for testing.

PART 3 EXECUTION

3.01 TESTING PREPARATION

A. Pipes shall be in place, backfilled, and anchored before beginning pressure testing.

B. The Contractor shall conduct pressure tests on exposed and aboveground piping after the piping has been installed and attached to the pipe supports, hangers, anchors, expansion joints, valves, and meters.

C. For buried piping, the pipe may be partially backfilled and the joints left exposed for inspection during an initial leakage test. However, perform the final pressure test after completely backfilling and compacting the trench.

D. Provide any temporary piping needed to carry the test fluid to the piping that is to be tested. After the test has been completed and demonstrated to comply with the Specifications, disconnect and remove temporary piping. Do not remove exposed vent and drain valves at the high and low points in the tested piping; remove any temporary buried valves and cap the associated outlets. Plug taps or connections to the existing piping from which the test fluid was obtained.

E. Provide temporary drain lines needed to carry testing fluid away from the pipe being tested. Remove such temporary drain lines after completing the pressure testing.

F. Before starting the test, the Contractor shall notify the Engineer and the Owner's Representative.

3.02 CLEANING

A. Before conducting hydrostatic tests, the Contractor shall flush pipes with water to remove dirt and debris. For pneumatic tests, blow air through the pipes. Maintain a flushing velocity of at least 3 fps for water testing and at least 2,000 fpm for pneumatic testing. Flush pipes for the period given by the formula

$$T = \frac{2L}{3}$$

in which:

T = flushing time (seconds)
L = pipe length (feet).

B. For pipelines 24 inches or larger in diameter, acceptable alternatives to flushing are use of high-pressure water jet, sweeping, or scrubbing. Water, sediment, dirt, and foreign material accumulated during this cleaning operation shall be discharged, vacuumed, or otherwise removed from the pipe.

3.03 TESTING AND DISINFECTION SEQUENCE FOR POTABLE WATER PIPING

A. Perform required disinfection after hydrostatic testing, unless otherwise indicated.

B. Disinfection shall be performed as described in Section 15141, Disinfection of Piping and Water Storage Facilities.

3.04 LENGTH OF TEST SECTION FOR BURIED PIPING

A. The maximum length of test section for buried pipe of 12 inches or smaller in diameter is 3,500 feet; for buried pipe larger than 12 inches, 1 mile. Provide intermediate test bulkheads where the pipeline length exceeds these limits.

3.05 INITIAL PIPELINE FILLING FOR HYDROSTATIC TESTING

A. The maximum rate of filling shall not cause the water velocity in the pipeline to exceed 1 fps. Filling may be facilitated by removing automatic air valves and releasing air manually.

3.06 TESTING NEW PIPE WHICH CONNECTS TO EXISTING PIPE

A. Before testing new pipelines that are to be connected to existing pipelines, the Contractor shall isolate the new line from the existing line by test bulkheads,

spectacle flanges, or blind flanges. After the new line has been successfully tested, remove test bulkheads or flanges and connect to the existing piping.

3.07 HYDROSTATIC TESTING OF ABOVEGROUND OR EXPOSED PIPING

A. Open vents at high points of the piping system to purge air while the pipe is being filled with water. Venting during system filling may also be provided by temporarily loosening flanges.

B. Subject the piping system to the test pressure indicated on the Piping Schedule in the Drawings. Maintain the test pressure for a minimum of 2 hours. Examine joints, fittings, valves, and connections for leaks. The piping system shall show zero leakage or weeping. Correct leaks and retest until zero leakage is obtained.

3.08 HYDROSTATIC TESTING OF BURIED PIPING

A. Where any section of the piping contains concrete thrust blocks or encasement, the Contractor shall not make the pressure test until at least 10 days after the concrete has been placed. When testing mortar-lined or PVC piping, fill the pipe to be tested with water and allow it to soak for at least 24 hours to absorb water before conducting the pressure test.

B. Apply and maintain the test pressure by a positive displacement hydraulic force pump.

C. Maintain the test pressure for the 2 hours by restoring the pressure whenever it falls 5 psi.

D. After the test pressure is reached, use a meter to measure the additional water added to maintain the pressure. This amount of water is the loss due to leakage in the piping system. The allowable leakage volume is defined by the formulas:

PVC Pipe:

$$L = \frac{ND(P)^{1/2}}{C}$$

in which:

L = allowable leakage (gallons)
N = number of rubber-gasketed joints in the pipe tested
D = diameter of the pipe (inches)
P = specified test pressure (psig)
C = 7,400

Ductile Iron Pipe:

$$L = \frac{SD(P)^{1/2}}{C}$$

in which:

L = allowable leakage (gallons)
S = length of pipe tested (feet)
D = diameter of the pipe (inches)
P = specified test pressure (psig)
C = 133,200

HDPE Pipe: As specified in Section 15146, High-Density Polyethylene (HDPE) Pipe.

E. The leakage test shall be a separate test following the pressure test and shall not be less than 2 hours long. All leaks evident at the surface shall be repaired and leakage eliminated regardless of the total leakage as shown by test. Lines that fail to meet tests shall be repaired and retested as necessary until test requirements are complied with. Defective materials, pipes, valves, and accessories shall be removed and replaced.

F. The allowable leakage for buried piping having threaded, brazed, or welded (including solvent welded) joints shall be zero.

G. Submit plan for testing to the Engineer for review at least 10 days before starting the test.

H. Peening shall not be used to repair pinhole leaks in welded pipes. Any leakage in welded pipes shall be repaired by appropriate welding techniques.

I. Repair and retest any pipes showing leakage rates greater than that allowed in the criteria above.

3.09 HYDROSTATIC FLUSHING AND TESTING OF FUEL OIL PIPING

A. Flush pipes with water to remove dirt and debris. Remove loose foreign material such as scale, sand, weld spatter particles, and cutting chips from the inside of piping assemblies. Hammer on the outside of steel piping with a nonmarring hammer to aid in freeing weld spatter, scale, and dirt.

B. Perform hydrostatic pressure testing as described previously.

C. After successfully completing the pressure testing, blow out the piping with clean, dry air having a dewpoint of at least -40°F. Circulate the air through the piping system until the exiting air has the same dewpoint as the applied air.

3.10 PRESSURE TESTING OF DOUBLE-WALLED CONTAINMENT PIPING

A. Test the primary pipe as described for buried and above-ground or exposed piping.

B. Test the secondary containment piping by performing a pneumatic test as described above of the annular space between the primary and secondary pipes at a pressure of 5 psi.

3.11 REPETITION OF TEST

A. If the actual leakage exceeds the allowable leakage, locate and correct the faulty work and repeat the test. Restore the work and all damage resulting from the leak and its repair. Eliminate visible leakage.

3.12 BULKHEAD AND TEST FACILITY REMOVAL

A. After a satisfactory test, the Contractor shall remove the testing fluid, remove test bulkheads and other test facilities, and restore the pipe coatings/linings.

END OF SECTION

SECTION 15146
HIGH-DENSITY POLYETHYLENE (HDPE) PIPE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Description: The Contractor shall provide all materials and incidentals, including piping, molded and ductile iron fittings, flanged adapters, flanged joints, mechanical joint adapters, hardware, and appurtenances for the HDPE piping systems shown on the Drawings and the Drawing Process Flow Identification.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance, and Section 15055, Piping Systems—General.

A. In general, shop drawings and related manufacturer's product certification shall be made in accordance with the General and Special Conditions of the Contract for approval before the manufacturer constructs or fabricates the material. The following items, which require shop drawings, are brought to the Contractor's attention. The list may not include all items for which shop drawing submittals are required to meet the requirements of the project.

1. Detail drawings of all classes of pipe, joints, and fittings.
2. Detail Drawings of all joints, including manufacturer's certified factory and/or laboratory test reports to confirm thrust-restraint capacities and restraining mechanism application.
3. Existing piping connection details.
4. Adapters for connection to mechanical joint valves and ductile iron pipe fittings.

B. Certification and test reports for the materials, manufacturing, and testing of the types of pipe supplied shall be furnished by the HDPE pipe manufacturer for the manufacturer's own products in accordance with the latest standards of the industry as described in this Section.

C. Provide a statement in writing from the HDPE pipe manufacturer that the manufacturer is listed with the Plastic Pipe Institute as a qualified extruder for the polyethylene resin to be used in the manufacture of the pipe for this project.

D. All persons making heat fusion joints shall receive training in the manufacturer's recommended procedures. The Contractor shall maintain records of trained

personnel and certify that training was received not more than 12 months before construction began. Additionally, the Contractor shall have worked on one or more projects involving combined installation of at least 10,000 feet of HDPE butt-fusion-welded pipe and shall provide the Engineer with a written list of HDPE pipeline installation experience, including project location, date, Owner, and personnel assigned and installing on this project.

E. The pipe manufacturer shall certify in writing that the Contractor is qualified to join, lay, and pull the pipe or representative of the pipe manufacturer shall be onsite to oversee all pipe joining. All costs for the manufacturer's representative shall be paid for by the Contractor.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM) Standards

1. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.
2. ASTM D3261—Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
3. ASTM D3350—Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
4. ASTM D4976—Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.
5. ASTM F714—Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter.

B. American Water Works Association (AWWA)

1. AWWA C151/A21.51—Ductile Iron Pipe, Centrifugally Cast, for Water.
2. AWWA C901—Polyethylene (PE) Pressure Pipe and Tubing, 1/2-inch (13 mm) through 3-Inch (76 mm), for Water Service.
3. AWWA C906—Polyethylene (PE) Pressure Pipe and Fittings, 4-Inch through 63-Inch (100 mm through 1,650 mm), for Waterworks.

C. International Organization for Standardization (ISO)

1. ISO 9001—Quality Management Systems – Requirements.

1.04 QUALITY ASSURANCE

A. The pipe and fitting manufacturer(s) shall have an established quality-control program responsible for inspecting incoming and outgoing materials. Incoming polyethylene materials shall be inspected for density, melt flow rated, and contamination. The cell classification properties of the material shall be certified by the supplier and verified by the manufacturer's quality control.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, and Section 15055, Piping Systems—General, for storing and protecting the items specified in this Section.

1.07 TESTING REQUIREMENTS

A. See Section 15144, Pressure Testing of Piping.

1.08 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 PIPE AND FITTINGS

A. General

1. All HDPE shall be DriscoPlex PE4710 (PE3408) HDPE; or approved equal.
2. All HDPE pipe 4 inches in diameter or greater shall have a Ductile Iron Pipe outside diameter, and HDPE pipe 3 inches in diameter and smaller shall be IPS unless otherwise specified or shown in the Drawings.
3. All HDPE piping system components shall be the products of one manufacturer.
4. Pipe and fittings shall be manufactured by an ISO 9001-certified manufacturer.

B. HDPE Pipe

1. HDPE pipe 4 inches in diameter and larger shall conform to material standard ASTM D3350 345434 E cell classification rated as PE4710 (PE3408) by the Plastics Pipe Institute. Minimum pressure rating shall be in accordance with Piping Schedule Drawing or as specified in this Section. Minimum pressure rating for HDPE pipe used at directional drilling crossings shall be 160 psi SDR 11 (Standard Dimension Ratio).
2. The polyethylene compound shall be suitably protected against degradation by ultraviolet light.
3. The maximum allowable hoop stress shall be 800 psi at 73.4ºF.
4. The pipe manufacturer shall be listed with the Plastic Pipe Institute as meeting the requirements of the resin manufacturer to manufacture pipe from the resin used.

C. Fittings

1. The pipe manufacturer shall mold or fabricate the polyethylene fittings. Butt fusion outlets shall be made to the same outside diameter, wall thickness, and tolerances as the mating pipe. All fittings and custom fabrications shall be fully rated for the same internal pressure as the mating pipe.

    a. Molded Fittings: Molded fittings shall be manufactured in accordance with ASTM D3261 and shall be so marked. Each production lot of molded fittings shall be subjected to the test required under ASTM D3261. The manufacturer shall submit samples from each molded fitting production lot to x-ray inspection for voids and shall certify that voids were not found.

        (1) Polyethylene Flange Adapters: Flange adapter shall be made with sufficient throughbore length to be clamped in a butt fusion joining machine without the use of a subend holder. The sealing surface of the flange adapter shall be machined with a series of small v-shaped grooves to restrain the gasket against blow-out. Flange adaptors shall be fitted with ductile-iron backup rings pressure rated equal to or greater than the mating pipe. The Contractor shall provide flat ring-type Viton gaskets with gasket thickness and hardness as recommended by the pipe manufacturer for use with HDPE flanged joints. Provide carbon steel hardware (bolts, nuts, washers, etc.) conforming to ASTM A307, Grade B for use with the flange adapters assemblies in accordance with the pipe manufacturer’s

recommendations. Gaskets shall be made from material suitable for exposure to the liquid within the pipe.

b. Fabricated Fittings: Fabricated fittings shall be made by heat fusion joining specially machined shapes cut from pipe, polyethylene sheet stock, or molded fittings. Fabricated fittings shall be rated for internal pressure service equivalent to the full-service pressure rating of the mating pipe. Pressure de-rated fittings are not acceptable. Directional fittings 16 inches IPS and larger, such as elbows, tees, crosses, etc., shall have a plain end inlet for butt fusion and flanged directional outlets.

2. D.I./HDPE Mechanical Joint Adaptors.

a. The manufacturer of the HDPE pipe shall supply all D.I./HDPE mechanical joint adaptors and accessories required to connect plain-end HDPE piping to mechanical joint fittings, valves, and appurtenances.

b. The D.I./HDPE mechanical joint adaptor shall consist of:

(1) A molded or fabricated HDPE mechanical joint transition fitting.
(2) A Buna-N gasket for a D.I. mechanical joint.
(3) A ductile iron mechanical joint backup drive ring.
(4) Cor-Ten mechanical joint tee bolts.
(5) A stainless-steel sleeve stiffener molded or fabricated within the MJ end of the HDPE mechanical joint adaptor fitting.

c. The D.I./HDPE mechanical joint adaptor shall be connected to the HDPE pipe by a heat-fused joint on one end and connected to a ductile iron pipe valve, fitting, or appurtenance with the internally stiffened mechanical joint end.

d. The tee bolts and backup drive ring shall act as a joint restraint for connections to mechanical joints.

e. The HDPE mechanical joint adaptor fitting shall be molded or fabricated by the manufacturer of the HDPE pipe. All molded fittings shall be fully pressure rated to match the SDR pipe pressure rating. Fabricated fittings shall be rated for internal pressure service equivalent to the full pressure rating of the mated IPS pipe.

f. If rework compounds are required, only those generated in the manufacturer's own plant from resin compounds of the same class and type from the same raw material supplier shall be used.

g. Solvent epoxy cementing and mechanical joining with bolt on wrap-around clamps shall not be used.

3. Ductile-iron fittings connected to SDR 11 HDPE pipe (4 inches and larger) shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.

D. HDPE Pipe Jointing Method

1. HDPE pipe shall be jointed by butt fusion in accordance with the pipe manufacturer's directions and only for pipe within one SDR ratio of each other.
2. For SDR ratios that are two or more apart (i.e., SDR 21 to an SDR 11), the joint shall be made using a restrained joints. Same-diameter pipe may be joined by using HDPE flange adapters and backup rings bolted to each other.
3. All HDPE pipe joined by butt fusion shall be made from the same class and type of raw material made by the same raw material supplier.
4. *Butt fusion* means the butt joining of the pipe by heat fusion aligned faces of the pipe ends (butts) in a suitable apparatus and joining under controlled pressure and alignment.
5. The external bead resulting from the butt-fusion process shall be visible and examined for complete butt-fusion 360^{o} around the pipe exterior.
6. Short spools of pipe between valves and fittings shall be ductile iron pipe, with all joints restrained for sizes 4 inches and larger. For 2-inch, the spool shall be Schedule 40 Type 304 stainless steel piping or Schedule 80 PVC piping with IP threads stainless steel or PVC fittings and all joints restrained.
7. Where approved by the Engineer, the HDPE pipe and fittings may be fused with Electrofusion Couplings, as manufactured by Central Plastics Company, or approved equal. Technical information must be provided to demonstrate that the fused coupling will not compromise the structural integrity of the HDPE pipe.

2.02 LOCATOR WIRE

A. All HDPE piping shall be installed with two insulated 12-gauge minimum AWG solid strand copper wires for location purposes as specified in Section 15055, Piping Systems—General.

PART 3 EXECUTION

3.01 GENERAL

A. All polyethylene pipe shall be cut, fabricated, joined, and installed in strict conformance with the pipe manufacturer's recommendations. Joining, laying, and pulling of polyethylene pipe shall be accomplished by personnel experienced in working with HDPE pipe.

3.02 LAYING PIPE

A. Joints

1. All HDPE to HDPE pipe joints shall be joined by heat fusion that produces homogeneous, sealed, leak-tight joints.
2. Restrained mechanical joint adaptors shall be provided at tie-ins with valves, ductile iron fittings, and other pipe materials.

B. Butt Fusion Testing

1. The Contractor shall test the first fusion of each day.
2. In testing, the fusion shall be allowed to cool completely and then fusion test straps shall be cut out. The test shall be a minimum of 12 inches or 30 times the wall thickness in length with the fusion in the center and a minimum of 1 inch or 1.5 times the wall thickness in width. Bend the test strap until the ends of the strap touch. The Contractor shall not begin until a fusion test has passed the bent strap test.

C. Pipe Deflection

1. When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane or where long radius curves are permitted, the amount of deflection shall not exceed 75% of that recommended by the manufacturer.

D. Pipe Cutting

1. Cutting HDPE butt fusion connections to HDPE pipe, valves, fittings, or closure pieces shall be done in a neat, workman-like manner without damaging the pipe. Ends shall be cut square and perpendicular to the pipe axis.

3.03 PERFORATED HDPE PIPING INSTALLATION (NOT USED)

3.04 FLUSHING AND CLEANING

A. Flushing and Cleaning shall be as specified in Section 15144, Pressure Testing of Piping.

3.05 TESTING AND LEAKAGE

A. Hydrostatic Tests—General

1. All testing shall comply with Section 15144, Pressure Testing of Piping, except as specified in this Section.

2. All field tests shall be made in the presence of the Owner or Engineer. Except as otherwise directed, all pipelines shall be tested. All piping to operate under liquid pressure shall be tested in sections of approved length, typically from valve to valve and in no case longer than 5,000 feet.

3. Hydrostatic testing shall consist of a combined pressure test and leakage test. The field test pressure shall be as indicated on the Drawing Piping Schedule, measured at the lowest point of the section being tested. The pressure shall be applied by a pump connected to the pipe in a manner satisfactory to the Engineer. The pump, pipe connection, and all necessary apparatus shall be furnished by the Contractor and shall be subject to the satisfaction of the Engineer.

4. The maximum duration for any test, including initial pressurization, initial expansion, and time at test pressure, must not exceed 8 hours. If the test is not completed due to leakage, equipment failure, etc., depressurize the test section and allow it to "relax" for at least 8 hours before bringing the test section up to test pressure again.

5. Monitored Make-Up Water Test: The test procedure consists of initial expansion and test phases.

   a. During the initial expansion phase, the test section is filled with water. Once the line is filled, make-up water is added at hourly intervals as required to maintain the test pressure for 3 hours.
   b. At the end of the initial expansion period, the addition of make-up water will cease. During the test phase, the pipe will not have any water added to it for the following 2 hours. The 2 hours will be the actual leakage test. At the end of the 2-hour period, measured make-up water will be added to the pipe to return it to the original test pressure.

c. If the amount of make-up water added is greater than calculated using the numbers listed below, the section being tested will be considered to have a leak. The leak shall be found and fixed at the Contractor's expense and that section of the line retested before continuing with subsequent leakage tests. Testing and repairs shall be repeated at the Contractor's expense until the amount of make-up water is less than the amount calculated using the numbers listed below.

ALLOWABLE FOR EXPANSION UNDER TEST PRESSURE*
POLYETHYLENE PIPE

Nominal Pipe Size (in.)	Allowances for Expansion (US Gal/100 Feet of Pipe)		
	1-Hour Test	2-Hour Test	3-Hour Test
6	0.30	0.60	0.90
12	1.1	2.3	3.4

These allowances only apply to the test phase and not to the initial expansion phase.

END OF SECTION

SECTION 15155
DUCTILE IRON PIPE AND FITTINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall provide all materials and incidentals, including piping, fittings, flanged joints, mechanical joints, retainer glands, polyethylene bagging for buried ductile iron piping, fittings, valves, and appurtenances for the ductile iron piping systems required for the work shown on the Drawings in the Piping Schedule.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. All ductile iron pipe and fittings to be installed under this Contract shall be inspected and tested at the foundry where the material for this project is manufactured. The Contractor shall submit sworn certificates of such tests and their results.

B. Shop Drawings, including layout drawings, shall be submitted as specified in Section 15055, Piping Systems—General.

C. The Contractor shall submit the pipe manufacturer's certification of compliance with the applicable Sections of the Specifications.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM A193/A193M—Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.

2. ASTM A194/A194M—Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure and High Temperature Service, or Both.
3. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.
4. ASTM A536—Standard Specification for Ductile Iron Castings.
5. ASTM A563—Standard Specification for Carbon and Alloy Steel Nuts.
6. ASTM B117—Standard Practice for Operating Salt Spray (Fog) Apparatus.
7. ASTM C150/C150M—Standard Specification for Portland Cement.
8. ASTM C283—Standard Test Methods for Resistance of Porcelain Enameled Utensils to Boiling Acid.
9. ASTM D714—Standard Test Method for Evaluating Degree of Blistering of Paints.
10. ASTM D792—Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
11. ASTM D1238—Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer.
12. ASTM E96—Standard Test Methods for Water Vapor Transmission of Materials.
13. ASTM G95—Standard Test Method for Cathodic Disbondment Test of Pipeline Coatings (Attached Cell Method).

B. American Society of Mechanical Engineers (ASME)

1. ASME B1.1—Unified Inch Screw Threads (UN and UNR Thread Form).
2. ASME B16.1—Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250.

C. American Water Works Association (AWWA)

1. AWWA C104/A21.4—Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
2. AWWA C110/A21.10—Ductile-Iron and Gray-Iron Fittings.
3. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
4. AWWA C115/A21.15—Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
5. AWWA C150/A21.50—Thickness Design of Ductile-Iron Pipe.
6. AWWA C151/A21.51—Ductile-Iron Pipe, Centrifugally Cast.
7. AWWA C153/A21.53—Ductile-Iron Compact Fittings.
8. AWWA C207—Steel Pipe Flanges for Waterworks Service Sizes, 4-Inch through 144-Inch (100 mm through 3,600 mm).

9. AWWA C600—Installation of Ductile-Iron Mains and their Appurtenances.
10. AWWA C651—Disinfecting Water Mains.

D. International Organization for Standardization (ISO)

1. ISO 9001—Quality Management Systems – Requirements.

E. NSF International (NSF)

1. NSF 61—Drinking Water System Components – Health Effects.

1.04 QUALITY ASSURANCE

A. Source Quality Control:

1. The ductile iron pipe manufacturer shall submit certification that the pipe and fitting products meet all tests required by AWWA C151/A21.51.
2. All materials shall be new and have a manufacturer's certificate verifying compliance to all tests and inspections as required in this Section. The weight, class, and casting period shall be shown on each piece of pipe. The manufacturer's "mark," the year produced, and the word "Ductile" or the letters "DI" shall be cast or stamped on all pipe.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 TESTING REQUIREMENTS

A. See Section 15144, Pressure Testing of Piping, for testing requirements.

1.08 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 GENERAL

A. All ductile iron piping shall be designed and manufactured in accordance with AWWA C150/A21.50 and AWWA C151/A21.51 for the following minimum operating conditions:

1. The minimum internal design pressure shall be 150 psi with a 100-psi surge allowance, with a safety factor of 2, for a total internal design pressure of 500 psi.

2. The external loads design criteria shall be for the minimum cover indicated on the Drawings at 120 lb per cubic feet soil weight and live load based on one AASHTO H-20 truck load. The thickness design of ductile iron pipe shall be in accordance with AWWA C150/A21.50.

3. The horizontal deflection of cement-mortar-lined ductile iron pipe resulting from external load conditions shall not exceed 3% of the pipe diameter based on the trench design shown on the Drawings.

4. Pressure Class: All ductile iron piping shall meet the following minimum working pressure classes:

   a. 4 inches through 12 inches: 350 psi.
   b. Pipe greater than 12 inches: 250 psi.

2.02 JOINTS

A. Ductile iron fittings shall be furnished with mechanical joints and flanged joint ends as shown on the Drawings and specified in this Section:

1. Mechanical Joints: All buried ductile iron fittings shall be furnished with mechanical joint ends unless noted otherwise. Mechanical joints shall conform to AWWA C111/A21.11. Glands shall be constructed of ductile iron.
2. Flanged Joints: Pipe for threaded flange fabrication shall be Special Thickness Class 53 in accordance with AWWA C110/A21.10, AWWA C111/A21.11, and AWWA C115/A21.15. Bolt circle and bolt holes shall match those of ASME B16.1 Class 125 flanges. The flanges shall be rated for a maximum working pressure of 250 psi. Threaded flanges shall be individually fitted and machine tightened on the pipe ends. Flange facing shall be smooth or with shallow serrations in accordance with AWWA C115/A21.15.

2.03 FITTINGS

A. General: Ductile iron pipe fittings shall be the compact type meeting the requirements of AWWA C110/A21.10 and AWWA C153/A21.53 where applicable. Ductile iron fittings shall be cement lined and seal coated or epoxy lined. Lining of fitting shall conform to lining specified for piping and service as specified on the Drawing, Flow Stream Identification. Fittings shall be manufactured in accordance with AWWA C110/A21.10. Where taps are shown on fittings, tapping bosses shall be provided. At a minimum, fittings shall have the same pressure rating as the connecting pipe.

1. Flanged Joint: AWWA C110/21.10 and ASME B16.1, faced and drilled 125-pound ANSI standard.

2. Mechanical Joint: AWWA C110/A21.10.

   a. Provide mechanical joint fittings for all buried fittings as shown in the Drawings, unless noted otherwise.
   b. Provide specified gaskets.

2.04 LINING AND COATING

A. The Contractor shall provide lined ductile iron piping and fittings in accordance with the Drawing, Flow Stream Identification. The Contractor shall perform all field measurements confirming the accuracy of the piping sizes and lengths shown on the Drawings. The Contractor shall notify the Engineer immediately before deviating from or altering the lining of ductile iron piping shown on the approved layout schedule.

B. Ceramic Epoxy Lined Pipe and Fittings: The Contractor shall notify the Engineer immediately before cutting epoxy-lined ductile iron pipe in the field. The Contractor shall repair the cut end in accordance with the pipe manufacturer's written procedures.

1. General: The lining shall be an amine-cured novalac epoxy containing at least 20% by volume of ceramic quartz pigment. The lining material shall be Protecto 401 Ceramic Epoxy as manufactured by Induron Protective Coatings, Inc. The lining shall be applied by a competent pipe lining specialty firm with a successful history of applying linings to the interior of ductile iron pipe and fittings.

2. Lining Materials: Lining material shall meet the following requirements and properties:

a. A permeability rating of 0.00 when tested according to Method A of ASTM E96, Procedure A with a test duration of 30 days.
b. The following test shall be run on coupons from lined ductile pipe:

Test Parameter	ASTM Test Method	Typical Value
Salt Spray	B117	0.0 undercutting after 2 years
Cathodic disbondment 1.5 volts @ 77° F	G95	No more than 0.5 mm undercutting after 30 days
Immersion	D714	No effect after 2 years for 20% sulfuric acid, 140°F 25% sodium hydroxide, 160°F distilled water
Immersion	D714	0.0 undercutting after 2 years for 120°F tap water

3. Application: The lining applicator shall apply lining according to the requirements of the Protecto 401 Specification and application methods and procedures.

C. Cement-Lined Ductile Iron Pipe and Fittings: Interior surfaces of all cement-lined ductile iron pipe, fittings, and specials shall be cleaned and lined in the shop with a standard thickness cement-mortar lining applied in conformity with AWWA C104/A21.4, Portland cement mortar. Every precaution shall be taken to prevent damage to the lining. If lining is damaged or found faulty at delivery site, the Contractor shall repair or replace damaged or unsatisfactory portions with lining conforming to these Specifications at no additional cost to the Owner. Pipe linings for potable water lines shall be NSF 61 approved.

1. All ductile iron pipe and fittings cement-mortar linings shall be surface sealed with an asphaltic seal coating, 1 mil, in accordance with AWWA C104/A21.4.

2.05 MANUFACTURERS

A. Acceptable ductile iron pipe manufacturers include US Pipe, American Ductile Pipe, Griffin Pipe, or approved equal.

2.06 BOLTS

A. General: The Contractor shall provide carbon steel, ASTM A307, Grade A hex head bolts and ASTM A563, Grade A hex head nuts. Threads shall be as specified in ASME B1.1 coarse thread series, Class 2A external and Class 2B internal.

Nuts, bolts, and gaskets for flanged fittings and blind flanges shall be designed to withstand the design and test pressure ratings for the pipe.

2.07 GASKETS

A. Gaskets for mechanical joints shall be compatible with potable water or sewage pipe service. See Section 15055, Piping System—General, for gasket requirements.

B. Gaskets for flanged joints shall be 1/8-inch-thick, cloth-inserted rubber conforming to applicable parts of ASME B16.21 and AWWA C207. Gasket material shall be free from corrosive alkali or acid ingredients and suitable for use in sewage and reclaimed water lines. Gaskets shall be full-face type for 125-pound flanges.

2.08 RETAINER GLANDS

A. Retainer glands shall be provided for all buried ductile-iron mechanical joints, fitting, and ductile-iron pipe connections to buried valves. Retainer glands shall be designed for joint retaining through the use of a follower gland and set screw-anchoring devices that impart multiple wedging action against the pipe. The mechanical joint-restraint device shall be UL listed and shall have a working pressure of at least 250 psi with a minimum safety factor of 2.

1. Gland: Manufactured of ductile iron conforming to ASTM A536. Gland dimensions shall match AWWA C111/A21.11 and AWWA C153/A21.53.

2. Restraining Devices: Manufactured of ductile iron heat treated to a minimum hardness of 370 BHN. Restraining devices shall incorporate a set screw/twist-off nut bolt to ensure the proper actuating of the restraining device. The twist-off nut shall be designed to come off at the torque limit desired to anchor the restraining device in place on the pipe.

3. Joint Deflection: Retainer gland joint deflection shall be limited to manufacturer's recommended maximum deflection angle. Joint deflection shall be applied before the set screws are torqued.

4. Acceptable Manufacturers:

    a. EBAA Iron, Inc. – Megalug 1100 Series.
    b. Or approved equal.

2.09 EXTERNAL PIPE RESTRAINTS

A. Ductile iron pipe push-on (bell and spigot) joint restraint shall be provided by a restraining harness consisting of a restraint ring, connecting tie-rods, and split-ring assembly installed at all push-on joints. The restraint ring shall consist of wedging components made from 60-42-12 ductile iron conforming to ASTM A536 and wedges heat treated to minimum 370 BHN. Torque limiting twist-off nuts shall be provided on each wedge to ensure proper applied installation torque. The split ring shall be made from 60-42-12 ductile iron conforming to ASTM A536. The connecting rods shall be made of steel conforming to AWWA C111/ A12.11. Sizes 4- to 16-inch-diameter restraining harnesses shall have 350-psi maximum working pressure rating and 18- to 36-inch-diameter restraining harnesses shall have 250-psi maximum working pressure rating. All harnesses shall be designed with a 2-to-1 safety factor applied to the maximum working pressure rating.

B. Acceptable Manufacturers

1. EBAA Iron, Inc. – Series 1700.
2. Or approved equal.

2.10 INTERNAL PIPE RESTRAINT

A. Acceptable Manufacturers

1. American Ductile Iron Pipe:

a. Fast Grip ® Gasket.
b. Flex Ring ® Joint.

2. US Pipe:

a. Field Lok ® Gasket.
b. TR Flex Restrained Joint Pipe and Fittings.

3. Or Engineer-approved equal.

2.11 POLYETHYLENE BAGGING

A. Polyethylene bagging for buried ductile iron pipe, fittings, and valves shall be 8 mils thickness minimum polyethylene, manufactured in accordance with ASTM D1238, Type I, Class C, Grade E1.

2.12 COLOR CODING OR MARKING

A. All potable water main pipe, including fittings, shall be color coded or marked using blue as a predominant color to differentiate drinking water from reclaimed or other water. Underground plastic pipe shall be solid-wall blue pipe, shall have a co-extruded blue external skin, or shall be white or black pipe with blue stripes incorporated into or applied to the pipe wall; and underground metal or concrete pipe shall have blue stripes applied to the pipe wall. Pipe striped during manufacturing of the pipe shall have continuous stripes that run parallel to the axis of the pipe, that are located at no greater than 90° intervals around the pipe, and that will remain intact during and after installation of the pipe. If tape or paint is used to stripe pipe during installation of the pipe, the tape or paint shall be applied in a continuous line that runs parallel to the axis of the pipe and that is located along the top of the pipe; for pipes with an internal diameter of 24 inches or greater, tape or paint shall be applied in continuous lines along each side of the pipe as well as along the top of the pipe. Marking tape shall be 3 inches wide with adhesive backing. Paint stripe shall be 3 inches wide. Aboveground pipe at drinking water treatment plants shall be color coded and labeled in accordance with subsection 62-555-320(10), FAC, and all other aboveground pipe shall be painted blue or shall be color coded or marked like underground pipe.

B. All reclaimed water valves and outlets shall be appropriately tagged or labeled bearing the words in English and Spanish. All piping, pipelines, valves, and outlets shall be color coded or otherwise marked to differentiate reclaimed water from domestic or other water. Underground ductile iron pipe shall be color coded or marked using purple as a predominant color. If tape is used to mark the pipe, the tape shall be permanently affixed to the top and each side of the pipe (three locations parallel to the axis of the pipe). For pipes less than 24 inches in diameter, a single tape may be used along the top of the pipe. Visible, aboveground portions of the reclaimed water distribution system shall be clearly color coded or marked.

PART 3 EXECUTION

3.01 HANDLING PIPE AND FITTINGS

A. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe, fitting, lining, and coating. Pipe and fittings shall not be dropped. All pipe and fittings shall be examined before installation, and no piece that the Engineer finds defective shall be installed. The Contractor shall repair any damage to the pipe and fittings coating and/or lining as directed by the Engineer. If the Engineer determines that the coating and/or lining cannot be repaired, the Contractor shall replace the damaged pipe and fittings at no additional compensation.

B. All pipe and fittings shall be subjected to a careful inspection immediately before installation.

C. If any defective pipe is discovered after it has been installed, the Contractor shall remove and replace it with a pipe in satisfactory condition at no additional expense to the Owner.

D. Ceramic epoxy and glass-lined pipe and fittings shall be handled only from the outside of the pipe and fittings. No forks, chains, straps, hooks, etc. shall be placed inside the pipe and fittings for lifting, positioning, or laying.

3.02 PIPE INSTALLATION

A. The Contractor shall provide and use proper implements, tools, and facilities for the safe and convenient performance of the work. All pipe, fittings, valves, and appurtenances shall be lowered carefully into the trench and at above-grade locations to prevent damage to the pipe, protective coating, lining, and polyethylene bagging. Under no circumstances shall pipeline materials be dropped off or dumped. A trench shall be dewatered before the pipe is installed.

B. The Contractor shall carefully examine all pipe fittings, valves, and other appurtenances for damage and other defects immediately before installation and before bagging buried ductile-iron pipe. The Contractor shall mark and hold defective materials for inspection by the Engineer, who may prescribe corrective repairs or reject the materials.

C. The Contractor shall remove all lumps, blisters, and excess coating from the socket and plain ends of push-on joint pipe for buried service. The outside of the plain end and the inside of the bell shall be wiped clean and dry and be free from dirt, sand, grit, or any foreign material before the pipe is laid in trench.

D. The Contractor shall prevent foreign material from entering the pipe while the pipe is being placed in the trench. During installation, no debris, tools, clothing, or other materials shall be placed in the pipe.

E. As each length of buried pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.

F. When pipe is not being laid, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer. When practical, the plug shall remain in place until the trench is pumped completely dry. Care shall be taken to prevent pipe flotation should the trench fill with water.

G. Trench width at the top of pipe, bedding conditions, and backfill placement and compaction shall be such that design loadings on the pipe will not be exceeded.

H. Joint Assembly: Pipe joints shall be assembled in accordance with the manufacturer's instructions and the requirements of AWWA C600.

1. Flanged Joint: Before connecting flanged pipe the Contractor shall thoroughly clean all faces of the flanges of all oil, grease, and foreign material. The rubber gaskets shall be checked for proper fit and thoroughly cleaned. Care shall be taken to ensure proper sealing of the flange gasket. Bolts shall be tightened so that the pressure on the gasket is uniform. Torque-limiting wrenches shall be used to ensure uniform bearing insofar as possible. If joints leak when the hydrostatic test is applied, the gaskets shall be removed and reset and bolts retightened.
2. Push-On, Restrained Joint, or Mechanical Joint: The Contractor shall joint piping in accordance with the manufacturer's recommendations. Provide all special tools and devices, such as special jacks, chokers, and similar items required for proper installation. Lubricant for the pipe gaskets shall be furnished by the pipe manufacturer, and no substitutes will be permitted under any circumstance.

I. Pipe Deflection: When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane or where long radius curves are permitted, the amount of deflection shall not exceed that shown in AWWA C600 and that recommended by the retainer gland manufacturer for mechanical joint pipe and fittings.

J. Pipe Cutting: For inserting valves, fittings, or closure pieces pipe shall be cut in a neat, workmanlike manner without damaging the pipe or lining. Ductile cast iron may be cut using an abrasive pipe saw, rotary wheel cutter, guillotine pipe saw, milling wheel saw, or oxyacetylene torch. Cut ends and rough edges shall be ground smooth, and for push-on joint connections the cut end shall be beveled.

3.03 ABOVE-GROUND PIPE INSTALLATION

A. The Contractor shall install pipe in horizontal or vertical planes, parallel or perpendicular to building surfaces unless otherwise shown. Support pipe and fittings to prevent strain on joints, valves, and equipment. Install flanged joints so that contact faces bear uniformly on the gasket. Tighten bolts in accordance with the pipe manufacturer's recommendations.

3.04 SURFACE PREPARATION AND PAINTING

A. All exposed pipe and fittings shall be painted as specified in Section 09900, Painting and Coating.

B. All buried steel bolts, nuts, washers, rods, harnesses, clamps, sleeves, and appurtenances shall be painted with System No. 21 as specified in Section 09900, Painting and Coating.

3.05 INSPECTION, TESTING, AND DISINFECTION

A. See Section 15055, Piping Systems—General; Section 15141, Disinfection of Piping and Water Storage Facilities; and Section 15144, Pressure Testing of Piping.

END OF SECTION

SECTION 15291
POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND FITTINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to furnish, install, and complete the AWWA C900 DR 18 PVC pipe and ductile iron fittings specified.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. All PVC pipe and fittings to be installed under this Contract shall be inspected and tested at the location where the material for this project is manufactured. The Contract shall submit certificates of such tests and their results.

B. The Contractor shall submit the pipe manufacturer's certification of compliance with the applicable sections of the Specifications.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society of Testing Materials (ASTM)

1. ASTM A242/A242M—Standard Specification for High-Strength Low-Alloy Structural Steel.
2. ASTM A536—Standard Specification for Ductile Iron Castings.
3. ASTM D2241—Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
4. ASTM F477—Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

B. American Water Works Association (AWWA)

1. AWWA C900—Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4-Inch to 12-Inch (100 mm to 300 mm), for Water Transmission and Distribution.
2. AWWA C905—Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14-Inch through 48-Inch (350 mm through 1,200 mm) for Water Transmission and Distribution.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 LARGE PVC PRESSURE PIPE

A. Large PVC Pressure Piping

1. Unless otherwise noted, PVC pressure pipe for nominal diameters 4 inches and larger shall conform to the requirements of AWWA C900 DR 18 up to 12 inches with gasketed integral bell ends. Pipe shall be designed for maximum working pressure of not less than 150 psi. Pipe shall be made to ductile iron pipe ODs instead of IPS. The PVC pipe shall be blue and NSF approved for potable water use and green for sewer main use.

B. Bell and Spigot

1. Pipe joints shall be made with integral bell and spigot pipe ends. The bell shall consist of an integral thickened wall section designed to be at least as strong as the pipe wall. The bell shall be supplied with a factory glued rubber ring gasket that conforms to the manufacturer's standard

dimensions and tolerances. The gasket shall meet the requirements of ASTM F477 "Elastomeric Seals (Gaskets) for Joining Plastic Pipe." PVC joints shall be "Ring-Tite" as manufactured by J-M Manufacturing Company, Inc. or an equal approved by the Engineer. Nontoxic gasket lubricant shall be as specified by the pipe manufacturer.

C. Restrained Joints

1. The following pipe joints and fittings restraint methods can be used to prevent pipe joints and fittings from separating under pressure. No additional financial compensation will be provided to the Contractor for providing the following methods of restraint:

a. C-900 PVC pipe bell and spigot joints (4-inch- through 12-inch-diameter pipe) shall be restrained with the EBAA Iron MEGALUG® Series 1600 Restrainer or an equal approved by the Engineer. The Series 1600 restrainers shall provide a minimum of 150-psi restraint to DR 18 (Class 150) pipe with a 3 to 1 safety factor. The restraining device and tee head bolts shall be manufactured of high-strength ductile iron meeting ASTM A536, Grade 65-42-10. Clamping bolts and nuts shall be manufactured of corrosion-resistant, high-strength, low-alloy CORTEN steel meeting the requirements of ASTM A242/A242M.

b. Mechanical joint fittings used with PVC pipe (3-inch- through 36-inch-diameter DR 18 pipe) shall be restrained with the EBAA Iron MEGALUG® Series 2000 PV Restrainer or an equal approved by the Engineer. The Series 2000 PV restrainers shall provide a minimum of 150-psi restraint with a 2 to 1 safety factor. The restraining device and Tee head bolts shall be manufactured of high-strength ductile iron meeting ASTM A536, Grade 65-42-10. Clamping bolts and nuts shall be manufactured of corrosion-resistant, high-strength, low-alloy CORTEN steel meeting the requirements of ASTM A242/A242M.

c. All parts of the joint restraint systems shall be coated with coal tar epoxy as in Section 09900, Painting and Coating, Mega-Bond coating system by EBAA Iron, Inc. or Engineer-approved equal.

2.02 LARGE PVC PRESSURE PIPE FITTINGS

A. Fittings for use with large PVC pipe shall be ductile-iron fittings conforming to the requirements of mechanical joint fittings as specified in Section 15155, Ductile Iron Pipe and Fittings.

B. Exterior Coating

1. Exterior coating for fittings shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.

C. Lining

1. Lining for fittings shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.
2. Any damaged lined areas shall be repaired in accordance with the manufacturer's recommendations so that the repaired area is equal to the undamaged lined areas.

2.03 SMALL PVC PRESSURE PIPE (NOT USED)

PART 3 EXECUTION

3.01 EXAMINATION

A. The Contractor shall examine pipe and appurtenances shall be examined at the point of delivery. Material found to be defective due to manufacture or damage in shipment shall be rejected. Tests as specified in the applicable material standard may be performed to ensure conformance with the standard.

3.02 PIPE INSTALLATION

A. Proper implements, tools, and facilities shall be provided and used for the safe and convenient performance of the work. All pipe, fittings, and valves shall be lowered carefully into the trench using suitable tools or equipment to prevent damage to pipeline materials. Under no circumstances shall pipeline materials be dropped or dumped into the trench. The trench shall be dewatered before installing the pipe in accordance with the Specifications.

B. The sealing surface of the pipe, the inside of the bell, and the inside of the gasket shall be cleaned immediately before assembly.

C. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. During laying operations, no debris, tools, clothing, or other materials shall be placed in the pipe.

D. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.

E. At all times when pipe laying is in progress, except when joining another piece of pipe, the open ends of the pipe shall be closed by a watertight plug or other means approved by the Engineer to prevent the entrance of objectionable materials. Care shall be taken to prevent pipe flotation.

F. Trench width at the top of the pipe, bedding conditions, and backfill placement and compaction shall be in accordance with the Contract Documents.

G. Joint Assembly

1. Pipe joints shall be assembled in accordance with the manufacturer's instructions.

H. Pipe Deflection

1. When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane, the amount of deflecting shall not exceed 75% of that recommended by the manufacturer.

I. Pipe Cutting

1. Cutting pipe for the insertion of valves, fittings, or closure pieces shall be done in a neat, workman-like manner without creating damage to the pipe. Ends shall be cut square and perpendicular to the pipe axis.
2. Burrs shall be removed from spigots, and ends shall be smoothly beveled. Field cut ends shall be marked for proper depth of joint assembly.

J. Thrust Restraint

1. All pipe, tees, valves, bends, and etc., unless otherwise specified, shall be restrained using mechanical means as specified. Pipe restraint using the specified mechanical restraining system with the restrained joint schedule or tie-rods is also acceptable. Reaction blocking shall not be used on this project.
2. All ductile iron fittings, valves, mechanical restraint harnesses, and other forms of mechanical restraint shall be installed and wrapped in polyethylene tube material as specified in Section 15155, Ductile Iron Pipe and Fittings.

3.03 LOCATION AND IDENTIFICATION

A. All non-metallic potable water and sewer mains shall be installed with a continuous, insulated 14-gauge copper wire installed directly on top of pipe for

location purposes. Detectable tape may be used in lieu of copper wire and shall be placed 1 foot above the top of the pipe.

B. All PVC sewer mains shall be a solid green color. All potable water mains shall be a solid blue color. All lettering shall appear legibly on pipe and shall run the entire length of the pipe. Lettering shall be appropriate for the intended use.

3.04 TESTING

A. All lines shall be tested at the pressures listed in the Piping Schedule in the Drawings.

B. See Section 15144, Pressure Testing of Piping, for the requirements of pipe flushing, cleaning, pressure and leakage testing, and inspection requirements.

C. See Section 15141, Disinfection of Piping and Water Storage Facilities, for the disinfection requirements.

END OF SECTION

APPENDIX A

REPORT OF A GEOTECHNICAL EXPLORATION

Engineering & Consulting, Inc.

SUMMARY REPORT OF A GEOTECHNICAL SITE EXPLORATION

NORTH SIDE LS PHASE 3
ZEPHYRHILLS, PASCO COUNTY, FLORIDA

GSE PROJECT NO. 16200

Prepared For:

JONES EDMUNDS & ASSOCIATES, INC.

SEPTEMBER 2023

GSE Engineering & Consulting, Inc.

September 8, 2023

Keyla Virgilio, E.I.
Jones Edmunds & Associates, Inc.
730 NE Waldo Road
Gainesville, Florida 32641

Subject: Summary Report of a Geotechnical Site Exploration
North Side LS Phase 3
Zephyrhills, Pasco County, Florida
GSE Project No. 16200

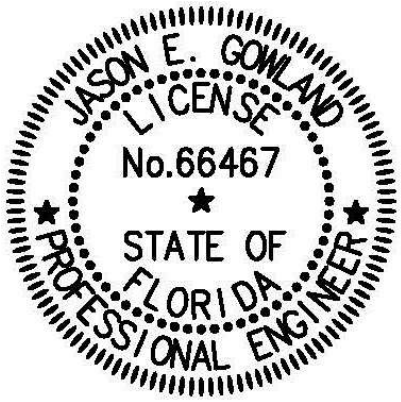
GSE Engineering & Consulting, Inc. (GSE) is pleased to submit this geotechnical site exploration report for the above referenced project.

Presented herein are the findings and conclusions of our exploration, including the geotechnical parameters and recommendations to assist with the force main and water main designs.

GSE appreciates this opportunity to have assisted you on this project. If you have any questions or comments concerning this report, please contact us.

Sincerely,

GSE Engineering & Consulting, Inc.



This item has been digitally signed and sealed by

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1.0 INTRODUCTION

1.1 General

GSE Engineering & Consulting, Inc. (GSE) has completed this geotechnical exploration for the proposed North Side LS Phase 3 located in Zephyrhills, Pasco County, Florida. This exploration was performed in accordance with GSE Proposal No. 2023-440 (Rev. 1) dated July 25, 2023. You authorized our services on July 26, 2023.

1.2 Project Description

This project will consist of a new force main on Ft. King Road and a force main and water main on Kossik Road. You provided information about the project including site plans illustrating the proposed force main and water main alignments and requested soil boring locations.

A proposed 6-inch diameter force main on Ft. King Road will be installed using horizontal direction drill (HDD) and conventional open trench methods. The force main will be located in the western Ft. King Road right-of-way.

A proposed 6-inch force main and a 12-inch water main are proposed along Kossik Road. Beginning at Ft. King Road, both mains will be located in the north right-of way. East of Lov Lane, the water main will transition to the south right-of way. The force main and water main will be constructed using both HDD and conventional open trench methods.

A recent aerial photograph of the site was obtained. The site plan and aerial photograph were used in preparation of this exploration and report.

1.3 Purpose

The purpose of this geotechnical exploration was to determine the general subsurface conditions, evaluate these conditions with respect to the proposed construction, and prepare geotechnical parameters and recommendations to assist with the force main and water main designs.

2.0 FIELD AND LABORATORY TESTS

2.1 General Description

The procedures used for field sampling and testing are in general accordance with industry standards of care and established geotechnical engineering practices for this geographic region. This exploration consisted of performing eleven (11) Standard Penetration Test (SPT) borings to depths of 10 feet below land surface (bls) along the force main and water main alignments.

The soil borings were performed at the approximate locations as shown on Figure 2. The borings were located at the site using the provided site plan and obvious site features as reference. The boring locations should be considered approximate. The soil borings were performed from August 21 through 24, 2023.

2.2 Standard Penetration Test Borings

The soil borings were performed with a drill rig employing flight auger drilling techniques and Standard Penetration Testing (SPT) in accordance with ASTM D1586. The SPTs were performed continuously to 10 feet and at 5-foot intervals thereafter. Soil samples were obtained at the depths where the SPTs were performed. The soil samples were classified in the field, placed in sealed containers, and returned to our laboratory for further evaluation.

After drilling to the sampling depth, the standard two-inch O.D. split-barrel sampler was seated by driving it 6 inches into the undisturbed soil. Then the sampler was driven an additional 12 inches by blows of a 140-pound hammer falling 30 inches. The number of blows required to produce the next 12 inches of penetration were recorded as the penetration resistance (N-value). These values and the complete SPT boring logs are provided in Section 5.1.

Upon completion of the sampling, the boreholes were abandoned in accordance with Water Management District guidelines.

2.3 Soil Laboratory Tests

The soil samples recovered from the soil borings were returned to our laboratory, and examined to confirm the field descriptions. Representative samples were then selected for laboratory testing. The laboratory tests consisted of eight (8) percent soil fines passing the No. 200 sieve determinations, eight (8) natural moisture content determinations, and two (2) corrosion series tests. These tests were performed in order to aid in classifying the soils and to further evaluate their engineering properties. The laboratory tests are provided in Section 5.2.

3.0 FINDINGS

3.1 Surface Conditions

Mr. Kevin P. Fisher, E.I. with GSE visited the site on August 2, 2023 to observe the site conditions and mark the boring locations. Mr. Fisher returned to the site on August 17, 2023 to re-mark several boring locations where the stakes went missing.

One force main will be located in the western Ft. King Road right-of-way. The other force main and water main will be located along Kossik Road. Beginning at Ft. King Road, both mains will be located in the north right-of way. East of Lov Lane, the water main will transition to the south right-of way.

The topography at the site is moderately sloping down towards Cass Road from the west and east. Regional topography is rolling hills. The provided site plans indicate the ground surface elevations across the site are near elevations 82 to 127 feet[1].

3.2 Subsurface Conditions

The locations of the SPT borings are provided on Figure 2. Complete logs for the borings are provided in Section 5.1. Descriptions for the soils encountered are accompanied by the Unified Soil Classification System symbol (SM, SP-SM, etc.) and are based on visual examination of the recovered soil samples and the laboratory tests performed. Stratification boundaries between the soil types should be considered approximate, as the actual transition between soil types may be gradual.

The SPT borings located along the proposed force main and water main indicate the soils across these areas are relatively consistent. The auger borings initially penetrated 2 to 10 feet of a near-surface sandy stratum consisting of poorly graded sand and sand with silt (SP, SP-SM). This was underlain by clayey to very clayey sand, sand with clay, and silty clayey sand (SC, SC/CL, SP-SC, SM-SC) to the explored depths of 10 feet bls.

The poorly graded sand and sand with silt (SP, SP-SM) is generally in a very loose to loose condition with N-values ranging from 4 to 9 blows per foot. The underlying clayey to very clayey sand, sand with clay, and silty clayey sand (SC, SC/CL, SP-SC, SM-SC) is generally in a loose to medium dense condition with N-values ranging from 5 to 12 blows per foot.

The groundwater table was encountered in the SPT borings A-9 and A-10 at depths ranging from 6 to 9 feet bls at the time of our investigation.

3.3 Review of Published Data

The majority of the site is mapped as eight soil series by the Soil Conservation Service (SCS) Soil Survey for Pasco County[2]. The following soil descriptions are from the Soil Survey.

Tavares sand, 0 to 5 percent slopes - This nearly level to gently sloping, moderately well drained soil is on low ridges and knolls throughout the county. Areas are irregular in shape.

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[1] Northside Lift Station Phase 3, Kossik Road Planview, Jones Edmunds Project No. 26110-053-01, April 2023

[2] Soil Survey of Pasco County, Florida. Soil Conservation Service, U.S. Department of Agriculture.

The soil is sand to a depth of 80 inches or more.

Typically, the surface later is very dark gray sand about 3 inches thick. Below this, layers of yellowish brown and light yellowish brown sand extend to a depth of 56 inches. Below this is a layer of very pale brown sand 20 inches thick, and below this, white sand extends to a depth of 80 inches or more.

Included with this soil in mapping are small areas of Adamsville, Astatula, and Candler soils. Also included are small areas of Millhopper and Sparr soils and, along rivers, a few areas of soils that occasionally are flooded. The included soils make up about 10 percent of the map unit.

In most years, under natural conditions, the water table is at a depth of 40 to 60 inches for 6 to 12 months and below 60 inches during very dry periods. The available water capacity is very low. Permeability is very rapid. Natural fertility is low.

Sparr fine sand, 0 to 5 percent slopes - This nearly level to gently sloping, somewhat poorly drained soil is on seasonally wet uplands. Slopes are smooth to concave. Areas are irregular in shape.

Typically, the surface layer is dark gray fine sand about 6 inches thick. The subsurface layer is about 37 inches thick. It is grayish brown fine sand in the upper 5 inches, pale brown fine sand in the next 24 inches, and light yellowish brown fine sand in the lower 8 inches. The subsoil is light yellowish brown sandy clay loam to a depth of about 80 inches.

Included with this soil in mapping are similar soils that have over 5 percent plinthite in the subsoil. Also included are small areas of Arredondo, Millhopper, Nobleton, and Tavares soils and a few areas along river that are occasionally flooded. The included soils make up about 15 percent of the map unit.

This Sparr soil has a water table, commonly perched above the subsoil, at a depth of 20 to 40 inches for 1 to 4 months during most years. The available water capacity is low in the surface and subsurface layers and is medium to high in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil.

Adamsville fine sand - This nearly level, somewhat poorly drained soil is on low broad flats that are less than 2 feet higher in elevation than the adjacent sloughs. Individual areas are irregular in shape and range from 5 to 200 acres. Slopes are less than 2 percent.

Typically, the surface layer is very dark gray fine sand about 3 inches thick. The subsurface layer is grayish brown fine sand 5 inches thick. The underlying material to a depth of 80 inches or more is fine sand. It is very pale brown to a depth of about 23 inches, light gray to a depth of 57 inches, and white below 57 inches.

Included with this soil in mapping are small areas of Narcoossee, Tavares, and Zolfo soils. Also included, along rivers, are a few areas of soils that occasionally are flooded. The included soils generally make up less than 10 percent of the map unit.

In most years, under natural conditions, the water table is at a depth of 20 to 40 inches for 2 to 6 months; but it may rise to within 20 inches of the surface for less than 2 weeks during very wet seasons. It recedes to a depth of more than 40 inches during dry periods. In this soil, available water capacity is low to very low. Natural fertility is low. Permeability is rapid.

Lake fine sand, 0 to 5 percent slopes - This nearly level to gently sloping, excessively drained soil is along ridgetops and on low hillsides in the uplands. Slopes are smooth to concave.

Typically, the surface layer is dark grayish brown fine sand about 8 inches thick. The next 52 Inches Is yellowish brown fine sand. Below this, and extending to a depth of more than 80 inches, is brownish yellow fine sand.

Included with this soil in mapping are small areas of Arredondo, Candler, Orlando, and Tavares soils. The included soils make up less than 15 percent of the map unit.

Permeability is rapid throughout the soil, and the water table is below a dep1h of 120 inches. The available water capacity is very low in all layers. The natural fertility and organic matter content are both low.

Arredondo fine sand, 0 to 5 percent slopes - This nearly level to gently sloping, well drained soil is on uplands. Individual areas are irregular in shape. Slopes are smooth to concave.

Typically, the surface layer consists of dark grayish brown fine sand about 5 inches thick and dark gray fine sand about 3 inches thick. The subsurface layer is about 50 inches thick. It is yellowish brown fine sand in the upper 10 inches and light yellowish brown fine sand in the remaining 40 inches. The subsoil is brownish yellow fine sand in the upper 5 inches. In the next 9 inches it is yellowish brown sandy clay loam mottled with red. Below that to a depth of 87 inches or more, is light yellowish brown sandy clay loam that is mottled.

Included with this soil in mapping are similar soils in which plinthite makes up more than.5 percent of the subsoil. Also included are small areas of Candler, Kendrick, Lake, Millhopper, and Sparr soils. The included soils make up about 15 percent of the map unit.

In this Arredondo soil, the available water capacity is low in the surface and subsurface layers and is high in the subsoil. Permeability is rapid in the surface and subsurface layers and is moderate or moderately rapid in the subsoil. Natural fertility is low.

Kendrick fine sand, 0 to 5 percent slopes - This well drained, nearly level to gently sloping soil is on uplands. Areas are large to small and are irregular in shape. Slopes are smooth to concave.

Typically, the surface layer is dark grayish brown fine sand about 7 inches thick. Next is a layer of fine sand about 21 inches thick. It is yellowish brown and brownish yellow in the lower 14 inches. The subsoil extends to a depth of 73 inches. In the upper 4 inches it is yellowish brown sandy clay loam. In the upper 14 inches it is mottled, yellowish brown sandy clay loan, and in the next 27 inches it is mottled, brownish yellow sandy clay loam. Below this to a depth of about 80 inches is mixed very pale brown, reddish yellow, and pink sandy clay loam.

Included with this soil in mapping are small areas of Arredondo, Blichton, and Nobleton soils. Also included are small areas of Kendrick soils that have slopes of 5 to 8 percent. The included areas make up about 15 percent of the map unit.

The water table is below a depth of 72 inches. The available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Natural fertility is medium. Permeability is rapid above the subsoil and moderate in the subsoil.

Kanapaha fine sand, 0 to 5 percent slopes - This nearly level to gently sloping, poorly drained soil is in low positions on uplands. Slopes are smooth to concave.

Typically, the surface layer is very dark gray fine sand 6 inches thick. The subsurface layer is fine sand about 66 inches thick. It is light brownish gray in the upper 7 inches, light gray in the next 32 inches, and white in the lower 27 inches. The subsoil extends below a depth of 80 inches. It is light brownish gray fine sandy loam.

Included with this soil in mapping are soils that are similar but differ by having a brownish stained subsurface layer or more than 6 percent plinthite in the subsoil. Also included are small areas of Blichton, Nobleton, and Sparr soils. Included soils make up less than 15 percent of any mapped area.

In most years, under natural conditions, this soil has a water table at a depth of less than 10 inches for 1 to 3 months and between depths of 10 and 40 inches for 3 to 4 months. In drier seasons, the water table recedes to a depth of more than 40 inches. The available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and is moderately slow in the subsoil.

Millhopper fine sand, 0 to 5 percent slopes - This nearly level to gently sloping, moderately well drained soil is on uplands. Individual areas are irregular in shape. Slopes are smooth to concave.

Typically, the surface layer is fine sand 7 inches thick. It is dark gray in the upper 3 inches and grayish brown below. The subsurface layer is fine sand and extends to a depth of about 59 inches. It is very pale brown to a depth of 42 inches and then changes to light yellowish brown. Below this, and extending to a depth of 80 inches or more, is the subsoil. It is yellowish brown fine sandy loam in the upper 5 inches and gray sandy clay loam below.

Included with this soil in mapping are similar soils on similar landscape positions. They differ slightly by containing more very fine sand in the surface and subsurface layers. Small areas of these soils are in several parts of the county, but are concentrated in the north-central part. Also included in mapping are small areas of Arredondo, Candler, Kendrick, Nobleton, Sparr, and Tavares soils. The included soils make up about 15 percent of the map unit.

In an unaltered state, this soil has a water table perched above the loamy horizon. The water is at a depth of 40 to 60 inches for 1 to 4 months and at a depth of 60 to 72 inches for 2 to 4 months in most years. In very wet years, the water table may be at a depth of 30 to 40 inches for a cumulative period of 1 to 3 weeks. The available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil.

3.4 Laboratory Soil Analysis

Selected soil samples recovered from the soil borings were analyzed for the percent soil fines passing the No. 200 sieve, natural moisture content, and corrosion series. Samples selected for laboratory testing were collected at depths ranging from 0 to 6 feet bls. These tests were performed to confirm visual soil classification and evaluate their engineering properties. The complete laboratory report is provided in Section 5.2.

The laboratory tests indicate the tested soils consist of sand with silt, silty clayey sand, clayey sand, and very clayey sand. The tested sand with silt (SP-SM) contains approximately 5.7 to 10 percent soil fines passing the No. 200 sieve with natural moisture contents of about 3.3 to 6.7 percent. The tested silty clayey sand (SM-SC) contains approximately 22 percent soil fines passing the No. 200 sieve with a natural moisture content of about 25 percent. The tested clayey sand (SC) contains approximately 20 to 21 percent soil fines passing the No. 200 sieve with natural moisture contents of about 13 to 15 percent. The tested very clayey sand (SC/CL) contains approximately 32 percent soil fines passing the No. 200 sieve with a natural moisture content of about 14 percent.

Two (2) soil samples were collected and analyzed for corrosion series testing. One soil sample was collected from SPT boring A-1 from 2 to 6 feet bls, while the other was collected from SPT boring A-2 from 2 to 6 feet bls. The soil sample from A-1 had a resistivity of 55,000 (ohm-cm) and the soil sample from A-2 had a resistivity of 22,000 (ohm-cm). The chloride contents of the tested samples were below detectable limits (BDL) for the soil samples from A-1 and A-2. The sulfate contents of the tested sampled were 24 and BDL for the soil samples from A-1 and A-2, respectively. The pH's of the tested samples were 5.33 and 8.04 for A-1 and A-2, respectively. The soils at the site are considered slightly to moderately aggressive for concrete[3]. The soils at the site are considered slightly to extremely aggressive for steel.

[3] Structures Design Guidelines, FDOT Structures Manual, Volume 1, January 2018, Table 1.3.2-1, p. 1-6.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General

The following recommendations are made based upon our understanding of the proposed construction, a review of the attached soil borings and laboratory test data, and experience with similar projects and subsurface conditions. If plans or the location of proposed construction changes from those discussed previously, GSE requests the opportunity to review and possibly amend our recommendations with respect to those changes.

The performance of site improvements may be sensitive to their post-construction relationship to site groundwater levels, seepage zones, or soil/rock characteristics exposed at final site grades. GSE recommends that use of boring information for final design of all site improvements be predicated on proper horizontal and vertical control of borings.

In this section of the report, we present our geotechnical parameters and recommendations to assist with the force main and water main designs as well as our general site preparation guidelines.

4.2 Groundwater

The groundwater table was encountered in SPT borings A-9 and A-10 at depths ranging from 6 to 9 feet bls at the time of our exploration. However, you should expect water to be at a depth of 1.5 and 9 feet bls at boring locations A-9 and A-10, respectively, after periods of heavy and seasonal rainfall.

4.3 Trench Excavation

Based on the information provided, we understand that the force main and water main will be constructed using trench and trenchless methods. The following subsections provide information for the design and construction of the force main and water main and excavations required for the proposed installation.

4.3.1 General

It is likely that auger pits will be required at certain locations to install the force main and water main. For design, the groundwater level should be assumed to exist at the seasonal high groundwater level since these conditions may exist after a heavy rain event. Geotechnical parameters were developed for the design of pit construction as part of the proposed force main and water main.

4.3.2 Geotechnical Parameters

Based on the soil conditions encountered by the borings, geotechnical design parameters were developed for the soils encountered across the site for the design of pit construction or horizontal directional drilling. These design parameters are provided in Table 1 below.

Table 1: Geotechnical Design Soil Parameters						
Boring No.	Range of Depths (ft bls)	Internal Friction Angle ϕ (degrees)	Moist Unit Weight γ (pcf)	Submerged Unit Weight γ (pcf)	Unconfined Compression q_u (ksf)	Cohesion c_u (ksf)
A-1	0 - 2	-	-	-	-	-
	2 - 10	30	112	50	-	-
A-2	0 - 8	29	92	30	-	-
	8 - 10	29	111	49	-	-
A-3	0 - 6	30	111	49	-	-
	6 - 10	28	115	53	-	-
A-4	0 - 6	29	90	28	-	-
	6 - 8	30	98	36	-	-
	8 - 10	28	111	49	-	-
A-5	0 - 4	-	-	-	-	-
	4 - 10	26	97	35	-	-
A-6	0 - 4	-	-	-	-	-
	4 - 8	30	100	38	-	-
	8 - 10	27	111	49	-	-
A-7	0 - 4	-	-	-	-	-
	4 - 10	30	114	52	-	-
A-8	0 - 10	30	101	39	-	-
A-9	0 - 10	30	107	45	-	-
A-10	0 - 10	30	103	41	-	-
A-11	0 - 8	30	100	38	-	-
	8 - 10	30	103	41	-	-

4.3.3 Excavation Stability

The open excavations may be shored or laid back to a stable slope or supported by some other equivalent means used to provide safety for workers and adjacent structures, if any. The excavations should be made in accordance with OSHA Standards, OSHA 2207, Subpart P, latest revision.

- Excavations less than 5 feet below land surface (bls) – Excavations that are less than 5 feet in depth should be effectively protected when an indication of ground movement is anticipated.
- Excavations greater than 5 feet bls – Excavations that are deeper than 5 feet should be sloped, shored, sheeted, braced, or laid back to a stable slope or supported by some other equivalent means or protection such that workers are not exposed to moving ground or cave-ins. The slopes and shoring should be in accordance with trench safety requirements as per OSHA Standards. For shoring greater than 20 feet (if needed), an engineering evaluation is required.

The excavation pits should be backfilled in accordance with the project specifications. It is likely the excavated material may be used as backfill material provided it meets the requirements of Section 4.7. Fill Suitability of this report. We recommend that the backfill be placed in maximum 12-inch loose lifts that are compacted to at least 95 percent of the Modified Proctor maximum dry density.

4.4 Trenchless Installation

We understand that portions of the proposed force main and water main will be installed using trenchless methods. Based on the soil conditions encountered, we recommend the geotechnical design parameters provided in Table 1 be used. GSE recommends that appropriate earth pressures be determined for the auger casing.

Carrier pipe must be sufficiently strong to withstand anticipated long-term ground loads and must not be subject to deterioration by substance either in the ground or in the casing. The carrier pipe design should include consideration of not only the loads applied to the pipe, but also factors other than soil loading. These factors could include minimum structural code requirements, loading from pipe jacking operations, and other construction loads. The geotechnical design parameters given in Table 1 should be used in analyzing the soil structure interaction of the carrier pipe.

4.5 Site Preparation

The soils at this site should be suitable for supporting the proposed construction using normal, good practice site preparation procedures. The following recommendations are our general guidelines for site preparation.

4.5.1 Stripping

If required, strip the construction limits and 10 feet beyond the perimeter of all grass, roots, topsoil, and other deleterious materials. You should expect to strip to depths of 12 or more inches. Deeper stripping may be necessary if major root systems are present at the site.

4.5.2 Dewatering

Temporary dewatering is not expected to be necessary for this project. However, if needed, we anticipate dewatering can be accomplished with sumps placed near the construction area, or with underdrains connected to a vacuum pump.

In any case, the site should always be graded to promote runoff and limit the amount of ponding. Localized ponding of stormwater is expected without proper grading during construction, and could render previously acceptable surfaces unacceptable.

4.5.3 Proof-Rolling

If required for slabs on grade or above ground improvements, proof-roll the subgrade with heavy rubber-tired equipment, such as a loaded front-end loader or dump truck, to identify any loose or soft zones not found by the soil borings. The proof-rolling should be monitored by a geotechnical engineer or qualified technician. Undercut or otherwise treat these zones as recommended by the geotechnical engineer in this report.

4.5.4 Fill Placement

Imported fill placed to raise the site grades or backfill for trenches should consist of clean sand having less than 10 percent passing the No. 200 sieve. On-site soils meeting the requirements of Section 4.7 may also be used as structural fill. The fill should be placed in maximum 12-inch loose lifts that are compacted to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557). If lighter “walk-behind” compaction equipment is used, this may require lifts of 4 inches or less to achieve the required degree of compaction.

4.6 Quality Control and Construction Materials Testing

It should be noted that the geotechnical engineering design does not end with the advertisement of the construction documents. As the geotechnical engineer of record, GSE is the most qualified to perform the construction materials testing that will be required for this project. The benefits of having the geotechnical engineer of record also perform the construction materials testing are numerous. If GSE continues to be involved with the project through construction, we will be able to constantly re-evaluate and possibly alter our geotechnical recommendations in a timely and cost effective manner once final design and construction techniques are developed. This often results in cost savings for the project.

4.7 Fill Suitability

The soils encountered at this site within the explored depths range from sands (SP) to very clayey sands (SC/CL). A discussion of the suitability for reuse as structural fill for each soil classification according to the Unified Soil Classification System (USCS) designation is provided below.

SP, SP-SM – Sands (SP) and sand with silt (SP-SM) have less than 5 percent and 12 percent soil fines passing the No. 200 sieve, respectively, and are typically well draining soils that are suitable for reuse as structural fill. The sands with silt may require moisture conditioning (drying) to make the material more workable. These soils will require stockpiling and drying before they are reused if they are excavated from below the water table.

SM – Silty sands (SM) can have between 12 percent and 50 percent soil fines passing the No. 200 sieve. Silty sands are typically non-plastic or have low plasticity, and can be reused as structural fill with precautions. Silty sands can be moisture sensitive and difficult to work and compact and can rut if the moisture content is near or above the optimum moisture content. We recommend these soils be moisture conditioned (dried) so that the moisture content during use is at or below the optimum moisture content. Aerating and exposure to the sun is typically the most effective methods of drying these soils. It may not be practical to reuse these materials during the wet season, as frequent rain showers may not allow these soils to dry to a workable moisture content. Suitable silty sands are limited to soil having less than 30 percent soil fines passing the No. 200 sieve. Silty sands with more than 30 percent soil fines are especially moisture sensitive, and are not recommended for reuse as structural fill. These soils will behave more as sandy silt, and for this reason, very silty sands having more than 30 percent soil fines passing the No. 200 sieve have been assigned a dual classification of SM/ML. Silty sand soils that are excavated from below the water table are not recommended for reuse as structural fill due to the amount of time that will be required to dry these soils to a workable condition.

SC – Clayey sand (SC) soils can have between 12 percent and 50 percent soil fines passing the No. 200 sieve. Clayey sands can have a high range of plasticity, varying from a PI of 7 or greater and plotting above the A-line to highly plastic. Friable clayey sands are typically suitable for use as structural fill with precautions. Clayey sands will be moisture sensitive and difficult to work and compact and can rut during placement if the moisture content is near or above the natural moisture content. We recommend these soils be moisture conditioned (dried) so that the moisture content during use is at or below the optimum moisture content. Aerating and exposure to the sun is typically the most effective methods of drying these soils. It may not be practical to reuse these materials during the wet season, as frequent rain showers may not allow these soils to dry to a workable moisture content. Suitable clayey sands are limited to soil having less than 30 percent soil fines passing the No. 200 sieve. Clayey sands with more than 30 percent soil fines passing the No. 200 sieve are especially moisture sensitive and are typically highly plastic, and are not recommended for reuse as structural fill. These soils will behave more as sandy clay, and for this reason, very clayey sands having more than 30 percent soil fines passing the No. 200 sieve have been assigned a dual classification of SC/CH or SC/CL. Clayey sand soils that are excavated from below the water table are not recommended for reuse as structural fill due to the amount of time that will be required to dry these soils to a workable condition.

ML, MH, CL, CH – Silts and clays are not suitable materials for reuse as structural fill.

When using on-site soils as fill materials, we recommend the silty and clayey sand soils (SM, SC) be used in the lower depths of the fill. Sand and sand with silt (SP, SP-SM) should be used in the upper portions of the fill. We recommend a minimum of 2 feet of sand (SP, SP-SM) cover the silty and clayey sand fill materials to reduce the potential for soggy surface conditions due to the low permeability characteristics of the silty and clayey sand materials.

5.0 FIELD DATA

5.1 Standard Penetration Test Soil Boring Logs

GSE Engineering & Consulting, Inc.
GSE Engineering
5590 SW 64th St
Gainesville, FL 32608
Telephone: 3523773233

BORING NUMBER A-1

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME North Side LS Phase 3
PROJECT NUMBER 16200
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** NE
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** >10 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Dark brown SAND with silt	2	AU 1							
2.5		(SC/CL) Loose to medium dense orange very clayey SAND		AU 2							
		pH = 5.33 *R = 55000* *Cl= BDL* *S = 24*		SPT 3	3-4-4-5 (8)				32	14	
5.0				SPT 4	5-5-4-5 (9)						
7.5				SPT 5	5-5-6-6 (11)						
10.0			10								
		Bottom of borehole at 10.0 feet.									

SPT BORINGS - GINT STD US.GDT - 9/8/23 09:13 - Q:\PROJECTS\16200 NORTH SIDE LS PHASE 3\16200 BORINGS\16200 BORINGS.GPJ

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GSE Engineering
5590 SW 64th St
Gainesville, FL 32608
Telephone: 3523773233

BORING NUMBER A-2

CLIENT Jones Edmunds & Associates, Inc. **PROJECT NAME** North Side LS Phase 3

PROJECT NUMBER 16200 **PROJECT LOCATION** Zephyrhills, Pasco County, Florida

DATE STARTED _____ **COMPLETED** _____ **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR Watson's Drilling, LLC **GROUND WATER LEVELS:**

DRILLING METHOD Flight Auger **AT TIME OF DRILLING** NE

LOGGED BY LBW **CHECKED BY** KPF **ESTIMATED SEASONAL HIGH** >10 ft

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Brown SAND with silt		AU 1							
			2								
2.5		(SP-SM) Very loose to loose pale brown SAND with silt		AU 2							
		pH = 8.04 *R = 22000* *Cl = BDL* *S = BDL*		SPT 3	2-3-2-2 (5)				7.4	5.8	
5.0											
				SPT 4	3-2-2-3 (4)						
7.5			8								
		(SC) Medium dense orange clayey SAND		SPT 5	4-5-6-7 (11)						
10.0			10								
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-3

CLIENT Jones Edmunds & Associates, Inc. **PROJECT NAME** North Side LS Phase 3

PROJECT NUMBER 16200 **PROJECT LOCATION** Zephyrhills, Pasco County, Florida

DATE STARTED _____ **COMPLETED** _____ **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR Watson's Drilling, LLC **GROUND WATER LEVELS:**

DRILLING METHOD Flight Auger ▼ **AT TIME OF DRILLING** NE

LOGGED BY LBW **CHECKED BY** KPF ▽ **ESTIMATED SEASONAL HIGH** >10 ft

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Loose brown SAND with silt		AU 1							
2.5				AU 2					5.7	3.3	
5.0			6	SPT 3	3-4-5-4 (9)						
7.5		(SC) Loose to medium dense orange clayey SAND		SPT 4	4-5-4-4 (9)						
10.0			10	SPT 5	5-6-5-5 (11)						
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-4

CLIENT Jones Edmunds & Associates, Inc. **PROJECT NAME** North Side LS Phase 3

PROJECT NUMBER 16200 **PROJECT LOCATION** Zephyrhills, Pasco County, Florida

DATE STARTED _____ **COMPLETED** _____ **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR Watson's Drilling, LLC **GROUND WATER LEVELS:**

DRILLING METHOD Flight Auger ▼ **AT TIME OF DRILLING** NE

LOGGED BY LBW **CHECKED BY** KPF ▽ **ESTIMATED SEASONAL HIGH** >10 ft

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Very loose brown SAND with silt		AU 1							
2.5				AU 2							
5.0			6	SPT 3	3-2-2-3 (4)						
7.5		(SP-SC) Loose orange SAND with clay	8	SPT 4	4-3-3-8 (6)						
10.0		(SC) Loose orange clayey SAND	10	SPT 5	4-4-5-4 (9)						
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-5

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME North Side LS Phase 3
PROJECT NUMBER 16200
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** NE
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** >10 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Brown SAND with silt	2	AU 1							
2.5		(SP) Pale brown SAND	4	AU 2							
5.0		(SC) Loose pale brown clayey SAND		SPT 3	2-3-2-2 (5)				20	15	
7.5				SPT 4	3-3-2-3 (5)						
10.0			10	SPT 5	4-4-3-4 (7)						
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-6

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME North Side LS Phase 3
PROJECT NUMBER 16200
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** NE
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** >10 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SC) Orange clayey SAND		AU 1					21	13	
2.5				AU 2							
			4								
		(SP-SC) Loose orange SAND with clay		SPT 3	2-3-3-2 (6)						
5.0											
				SPT 4	4-3-4-4 (7)						
7.5			8								
		(SC) Loose orange clayey SAND		SPT 5	4-4-5-4 (9)						
10.0			10								
		Bottom of borehole at 10.0 feet.									

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Telephone: 3523773233

BORING NUMBER A-7

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME North Side LS Phase 3
PROJECT NUMBER 16200
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** NE
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** >10 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Dark brown SAND with silt		AU 1							
2.5			4	AU 2							
5.0		(SM-SC) Loose to medium dense brown silty clayey SAND		SPT 3	3-4-4-5 (8)				22	25	
7.5				SPT 4	5-5-4-5 (9)						
10.0			10	SPT 5	5-6-6-5 (12)						
		Bottom of borehole at 10.0 feet.									

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Telephone: 3523773233

BORING NUMBER A-8

CLIENT Jones Edmunds & Associates, Inc. **PROJECT NAME** North Side LS Phase 3

PROJECT NUMBER 16200 **PROJECT LOCATION** Zephyrhills, Pasco County, Florida

DATE STARTED _____ **COMPLETED** _____ **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR Watson's Drilling, LLC **GROUND WATER LEVELS:**

DRILLING METHOD Flight Auger ▼ **AT TIME OF DRILLING** NE

LOGGED BY LBW **CHECKED BY** KPF ▽ **ESTIMATED SEASONAL HIGH** >10 ft

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SC) Loose brown SAND with clay		AU 1							
2.5				AU 2							
5.0				SPT 3	2-3-3-4 (6)						
7.5				SPT 4	4-3-3-4 (6)						
10.0			10	SPT 5	5-4-4-5 (8)						
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-9

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME North Side LS Phase 3
PROJECT NUMBER 16200
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** 9.0 ft
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 9.0 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Brown SAND with silt		AU 1							
2.5				AU 2					8.3	5.3	
			4								
		(SP) Loose pale brown SAND		SPT 3	3-4-3-4 (7)						
5.0											
				SPT 4	4-5-4-4 (9)						
7.5		▼									
				SPT 5	3-4-4-3 (8)						
10.0			10								
		Bottom of borehole at 10.0 feet.									

SPT BORINGS - GINT STD US.GDT - 9/8/23 09:13 - Q:\PROJECTS\16200 NORTH SIDE LS PHASE 3\16200 BORINGS\16200 BORINGS.GPJ

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Telephone: 3523773233

BORING NUMBER A-10

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME North Side LS Phase 3
PROJECT NUMBER 16200
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** 6.0 ft
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0.0		(SP-SM) Loose dark brown SAND with silt		AU 1							20 40 60 80
2.5				AU 2							
5.0			6	SPT 3	4-3-4-4 (7)						
7.5		(SP-SM) Loose brown SAND with silt		SPT 4	5-4-4-3 (8)						
10.0			10	SPT 5	4-3-3-4 (6)						
		Bottom of borehole at 10.0 feet.									

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Telephone: 3523773233

BORING NUMBER A-11

CLIENT Jones Edmunds & Associates, Inc. **PROJECT NAME** North Side LS Phase 3

PROJECT NUMBER 16200 **PROJECT LOCATION** Zephyrhills, Pasco County, Florida

DATE STARTED _____ **COMPLETED** _____ **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR Watson's Drilling, LLC **GROUND WATER LEVELS:**

DRILLING METHOD Flight Auger **AT TIME OF DRILLING** NE

LOGGED BY LBW **CHECKED BY** KPF **ESTIMATED SEASONAL HIGH** >10 ft

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Brown SAND with silt		AU 1					10	6.7	
			2								
2.5		(SP) Loose pale brown SAND		AU 2							
5.0				SPT 3	2-2-3-2 (5)						
7.5				SPT 4	3-4-4-3 (8)						
			8								
		(SP-SC) Loose pale brown SAND with clay		SPT 5	4-3-4-4 (7)						
10.0			10								
		Bottom of borehole at 10.0 feet.									

SPT BORINGS - GINT STD US.GDT - 9/8/23 09:13 - Q:\PROJECTS\16200 NORTH SIDE LS PHASE 3\16200 BORINGS\16200 BORINGS.GPJ

5.2 Laboratory Results

GSE Engineering & Consulting, Inc.

SUMMARY REPORT OF LABORATORY TEST RESULTS

Project Number: 16200

Project Name: North Side LS Phase 3

Boring Number	Depth (ft)	Soil Description	Natural Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Percent Passing No. 200 Sieve	Organic Content (%)	Hydraulic Conductivity (ft/day)	Unified Soil Classification
A-1	2-6	Loose to medium dense orange very clayey SAND	14				32			SC/CL
A-2	2-6	Very loose to loose pale brown SAND with silt	5.8				7.4			SP-SM
A-3	2-4	Loose brown SAND with silt	3.3				5.7			SP-SM
A-5	4-6	Loose pale brown clayey SAND	15				20			SC
A-6	0-2	Orange clayey SAND	13				21			SC
A-7	4-6	Loose to medium dense brown silty clayey SAND	25				22			SM-SC
A-9	2-4	Brown SAND with silt	5.3				8.3			SP-SM
A-11	0-2	Brown SAND with silt	6.7				10			SP-SM

GSE Engineering & Consulting, Inc.

SUMMARY REPORT OF LABORATORY TEST RESULTS

Project Number: 16200

Project Name: North Side LS Phase 3

Boring Number	Depth (ft)	Soil Description	pH	Resistivity (ohm-cm)	Chloride Content (ppm)	Sulfate Content (ppm)
A-1	2-6	Loose to medium dense orange very clayey SAND	5.33	55000	BDL	24
A-2	2-6	Very loose to loose pale brown SAND with silt	8.04	22000	BDL	BDL

5.3 Key to Soil Classification

KEY TO SOIL CLASSIFICATION CHART

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests				SYMBOLS		GROUP NAME
				GRAPHIC	LETTER	
COARSE-GRAINED SOILS	Gravels	Clean Gravels	Cu ≥ 4 and 1 ≤ Cc ≤ 3		GW	Well graded GRAVEL
More than 50% retained on No. 200 sieve	More than 50% of coarse fraction retained on No. 4 sieve	Less than 5% fines	Cu < 4 and/or 1 > Cc > 3		GP	Poorly graded GRAVEL
		Gravels with fines	Fines classify as ML or MH		GM	Silty GRAVEL
		More than 12% fines	Fines classify as CL or CH		GC	Clayey GRAVEL
	Sands	Clean Sands	Cu ≥ 6 and 1 ≤ Cc ≤ 3		SW	Well graded SAND
	50% or more of coarse fraction passes No. 4 sieve	Less than 5% fines	Cu < 6 and/or 1 > Cc > 3		SP	Poorly graded SAND
		Sand with fines	Fines classify as ML or MH		SP-SM	SAND with silt
		5% ≤ fines < 12%	Fines classify as CL or CH		SP-SC	SAND with clay
		Sand with fines	Fines classify as ML or MH		SM	Silty SAND
		12% ≤ fines < 30%	Fines classify as CL or CH		SC	Clayey SAND
		Sand with fines	Fines classify as ML or MH		SM	Very silty SAND
		30% fines or more	Fines classify as CL or CH		SC	Very clayey SAND
FINE-GRAINED SOILS	Clays	inorganic	50% ≤ fines < 70%		CL/CH	Sandy CLAY
50% or more passes the No. 200 sieve			70% ≤ fines < 85%		CL/CH	CLAY with sand
			fines ≥ 85%		CL/CH	CLAY
	Silts and Clays	inorganic	PI > 7 and plots on/above "A" line		CL	Lean CLAY
	Liquid Limit less than 50		PI < 4 or plots below "A" line		ML	SILT
		organic	Liquid Limit - oven dried / Liquid Limit - not dried < 0.75		OL	Organic clay / Organic silt
	Silts and Clays	inorganic	PI plots on or above "A" line		CH	Fat CLAY
	Liquid Limit 50 or more		PI plots below "A" line		MH	Elastic SILT
		organic	Liquid Limit - oven dried / Liquid Limit - not dried < 0.75		OH	Organic clay / Organic silt
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor				PT	PEAT

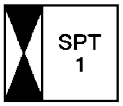
CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

	No. OF BLOWS, N	RELATIVE DENSITY
	0 - 4	Very Loose
	5 - 10	Loose
SANDS:	11 - 30	Medium dense
	31 - 50	Dense
	OVER 50	Very Dense

	No. OF BLOWS, N	RELATIVE DENSITY
	0 - 8	Very Soft
	9 - 18	Soft
LIMESTONE:	19 - 32	Moderately Hard
	33 - 50	Hard
	OVER 50	Very Hard

	No. OF BLOWS, N	CONSISTENCY
	0 - 2	Very Soft
SILTS	3 - 4	Soft
&	5 - 8	Firm
CLAYS:	9 - 15	Stiff
	16 - 30	Very Stiff
	31 - 50	Hard
	OVER 50	Very Hard

SAMPLE GRAPHIC TYPE LEGEND



Location of SPT Sample



Location of Auger Sample

PARTICLE SIZE IDENTIFICATION

BOULDERS:		Greater than 300 mm
COBBLES:		75 mm to 300 mm
GRAVEL:	Coarse -	19.0 mm to 75 mm
	Fine -	4.75 mm to 19.0 mm
SANDS:	Coarse -	2.00 mm to 4.75 mm
	Medium -	0.425 mm to 2.00 mm
	Fine -	0.075 mm to 0.425 mm
SILTS & CLAYS:		Less than 0.075 mm

LABORATORY TEST LEGEND

LL	=	Liquid Limit, %
PL	=	Plastic Limit, %
PI	=	Plasticity Index, %
% PASS - 200	=	Percent Passing the No. 200 Sieve
MC	=	Moisture Content, %
ORG	=	Organic Content, %
k_h	=	Horizontal Hydraulic Conductivity, ft/day

6.0 LIMITATIONS

6.1 Warranty

This report has been prepared for our client for their exclusive use, in accordance with generally accepted soil and foundation engineering practices, and makes no other warranty either expressed or implied as to the professional advice provided in the report.

6.2 SPT Borings

The determination of soil type and conditions was performed from the ground surface to the maximum depth of the borings, only. Any changes in subsurface conditions that occur between or below the borings would not have been detected or reflected in this report.

Soil classifications that were made in the field are based upon identifiable textural changes, color changes, changes in composition or changes in resistance to penetration in the intervals from which the samples were collected. Abrupt changes in soil type, as reflected in boring logs and/or cross sections may not actually occur, but instead, be transitional.

Depth to the water table is based upon observations made during the performance of the SPT borings. This depth is an estimate and does not reflect the annual variations that would be expected in this area due to fluctuations in rainfall and rates of evapotranspiration.

6.3 Site Figures

The measurements used for the preparation of the figures in this report were made using the provided site plans and by estimating distances from existing structures and site features. Figures in this report were not prepared by a licensed land surveyor and should not be interpreted as such.

6.4 Unanticipated Soil Conditions

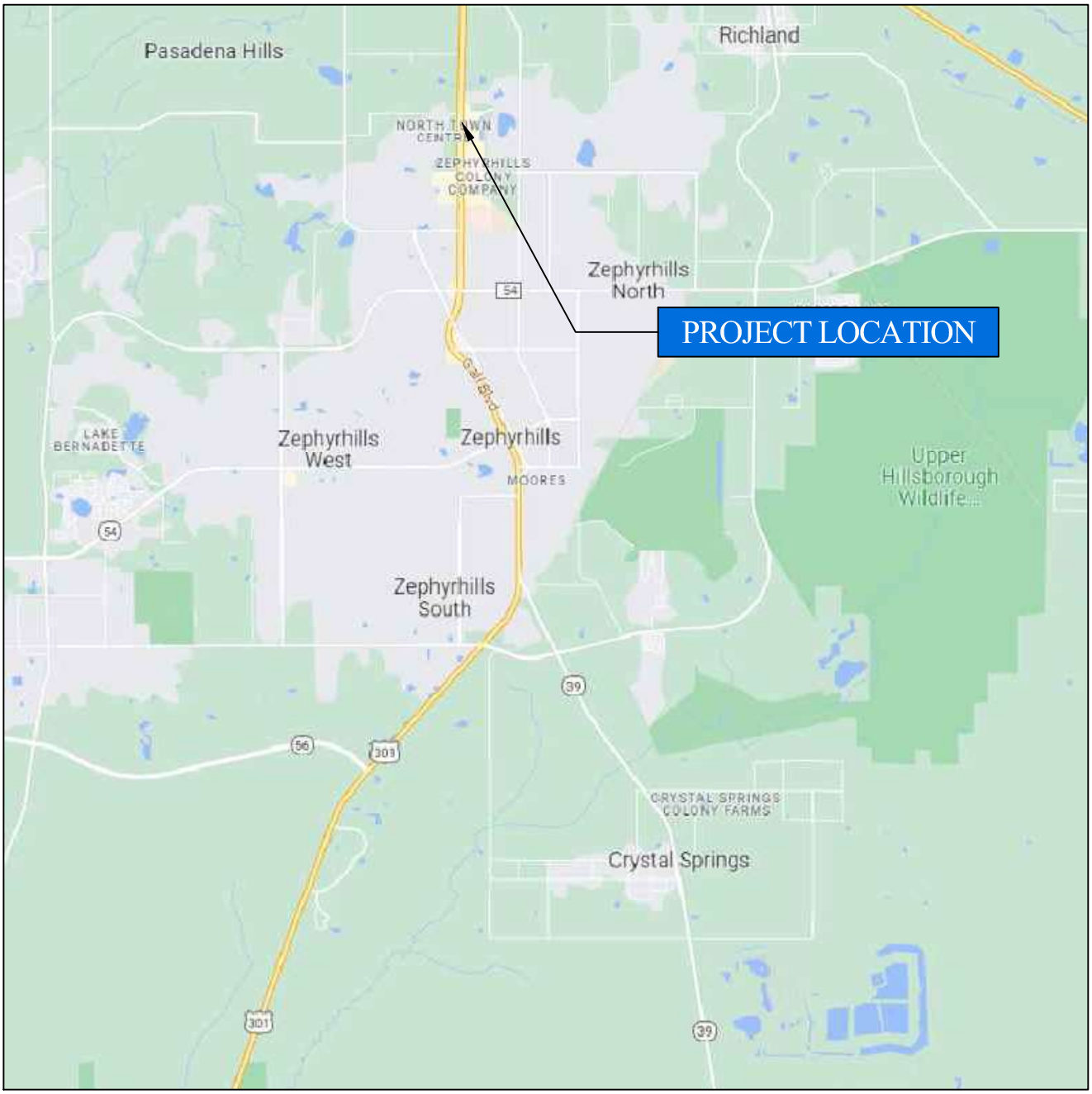
The analysis and recommendations submitted in this report are based upon the data obtained from soil borings performed at the locations indicated on Figure 2. This report does not reflect any variations that may occur between these borings.

The nature and extent of variations between borings may not become known until excavation begins. If variations appear, we may have to re-evaluate our recommendations after performing on-site observations and noting the characteristics of any variations.

6.5 Misinterpretation of Soil Engineering Report

GSE Engineering & Consulting, Inc. is responsible for the conclusions and opinions contained within this report based upon the data relating only to the specific project and location discussed herein. If others make the conclusions or recommendations based upon the data presented, those conclusions or recommendations are not the responsibility of GSE.

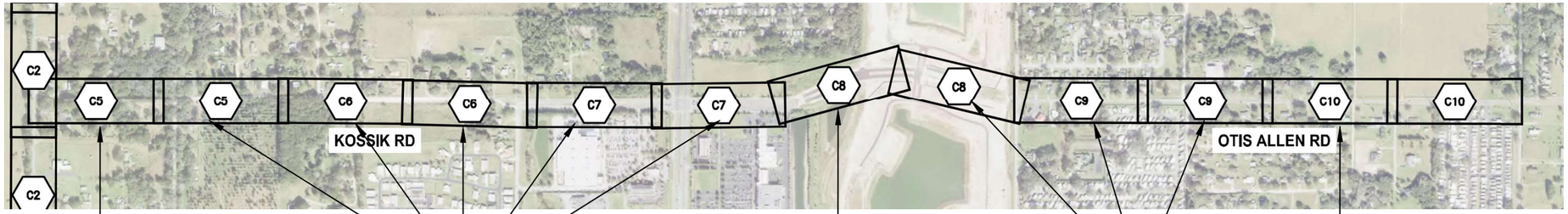
FIGURES



NORTH

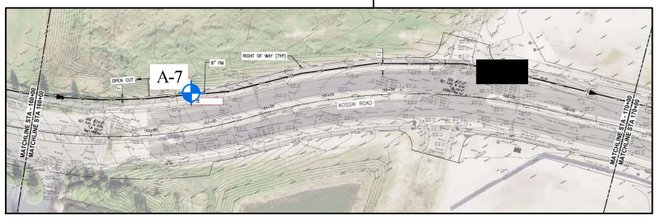
NOT TO SCALE

NORTH SIDE LS PHASE 3 ZEPHYRHILLS, PASCO COUNTY, FLORIDA GSE PROJECT NO. 16200	PROJECT SITE LOCATION MAP		
	DESIGNED BY: KPF CHECKED BY : JEG DRAWN BY : EEW	GSE Engineering & Consulting, Inc.	FIGURE 1





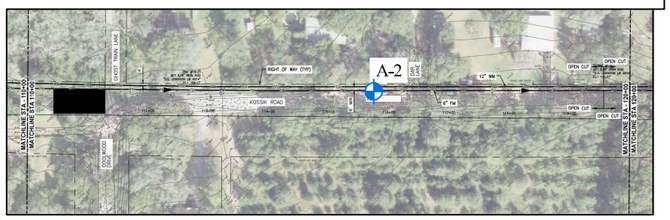
C5



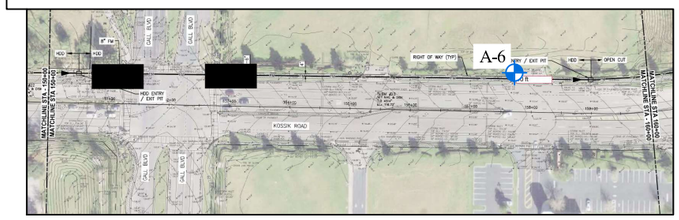
C8



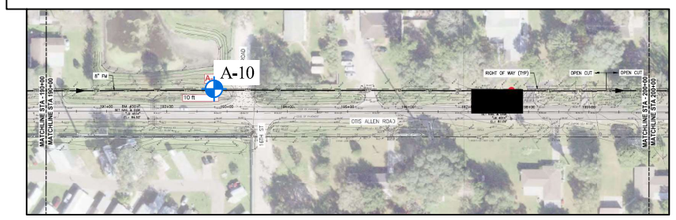
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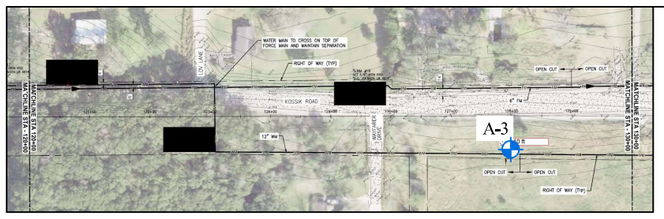
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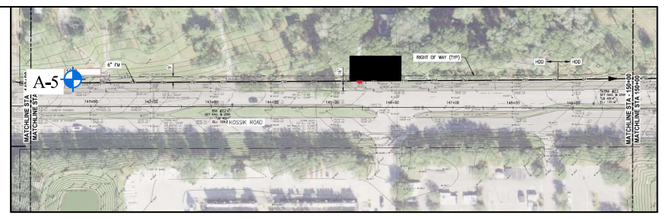
C7



C9



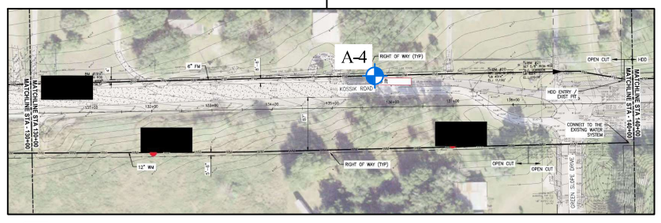
C6



C7



C9



C6



C8

LEGEND:

SPT BORING

0 250'

SCALE: 1" = 250' APPROX.

SITE PLAN SHOWING APPROXIMATE LOCATIONS OF FIELD TESTS

NORTH SIDE LS PHASE 3
ZEPHYRHILLS, PASCO COUNTY, FLORIDA
GSE PROJECT NO. 16200

DESIGNED BY : KPF
CHECKED BY : JEG
DRAWN BY : EEW

GSE Engineering & Consulting, Inc.

FIGURE 2

APPENDIX B

PERMITS

Pasco County
Florida Department of Transportation (FDOT)
Florida Department of Environmental Protection (FDEP) (Water)
Florida Department of Environmental Protection (FDEP) (Wastewater)
Environmental Resource Permit

Pasco County Permit

FDOT Permit

FLORIDA DEPARTMENT OF TRANSPORTATION

UTILITY PERMIT

December 14, 2016

PERMIT NO: 2023-H-798-00203

STATE ROAD INFORMATION

County:	Section:	State Road No:	Beginning Mile Post:	Ending Mile Post:
Pasco	14050000	SR 39	7.847	7.847

APPLICANT INFORMATION

The Utility Agency Owner (UAO) shall be identified in this Applicant Information Box. When the UAO is a City or County and desires to have the Utility Builder make a joint permit applicant, as prescribed in Section 2.1(4) of the 2017 Utility Accommodation Manual (UAM), the Utility Builder shall also be identified in this Applicant Information Box. A Utility Builder alone cannot apply for a utility permit without the City or County adding them as a joint applicant.

Utility Agency/Owner (UAO)

Name: City of Zephyrhills Utilities Department
Contact Person: City of Zephyrhills Utilities Department
Address: 5335 8th St
City: Zephyrhills
State: Florida
Zip: 33542
Telephone: 8137800008
Email: jbostic@ci.zephyrhills.fl.us

Utility Builder (only applicable when the UAO is a City or County)

Name:
Contact Person:
Address:
City:
State:
Zip:
Telephone:
Email:

WORK DESCRIPTION

The Applicant(s) requests permission from the Florida Department of Transportation (FDOT) to construct, operate, and maintain the utilities as described below and as depicted in the incorporated documentation.

The project includes the installation of approximately 12,400 LF of 6" PVC and 5,600 LF of 8" force main and approximately 4,000 LF of 12" PVC potable water main. Project restoration will include; pavement repair, mill and overlay of the roads, re-sodding of affected areas, and replacement of concrete curb/gutter and sidewalk.

Utility Work No:

Additional sheets are attached and are incorporated into this permit Yes ☐ No ☑

For FDEP certification, the FDOT agency report is attached in accordance with UAM Section 2.4.1 (13) Yes ☐ No ☑

TRAFFIC CONTROL (TCP)

☑ The TCP will comply with the following 600 series index(es) 602, 611

☐ A TCP has been attached and incorporated into this permit application in compliance with UAM Section 2.4.2.

MOT Technician's contact information (may be supplied at the two (2) business day notification to FDOT):

Name: _____ Telephone _____ Email: _____

COMMENCEMENT OF WORK

The UAO and/or Utility Builder shall commence actual construction in good faith within sixty (60) calendar days after approval of the permit application. If the beginning date is more than sixty (60) calendar days from the date of approval, the UAO and/or Utility Builder must review the permit with the FDOT Approving Engineer listed to make sure no changes have occurred to the transportation facility that would affect the permit's continued approval. The UAO and/or Utility Builder shall make good faith efforts to expedite the work and complete the work within the calendar days indicated.

Anticipated Start Date: 1/1/2024

Calendar days needed to completed: 365

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

Florida Department of Transportation

UTILITY PERMIT

PERMIT NO: 2023-H-798-00203

APPLICANT SIGNATURE

By the below signature(s) the UAO and/or Utility Builder agree(s) to construct, operate, and maintain the work as noted in the above Work Description, shown in plans and incorporated documents, in compliance with the UAM, all instructions noted in the FDOT Special Instructions Box, and special instructions incorporated into this permit. The UAO and/or Utility Builder declares, the location of all existing utilities that it owns or has an interest in, both aerial and underground, are accurately shown on the plans of the work areas. In accordance with UAM Section 2.8, the UAO and/or Utility Builder further declares that a letter of notification was delivered to the owners of other facilities within the work areas and that those listed below are the only facility owners known to be involved or potentially impacted by the proposed work.

Date Notified:	Name of other facility owners (attach additional sheets if necessary).
6/22/2023	Charter Communications - Duffy McClelland
6/22/2023	City of Zephyrhills - Bruce Sellars
7/6/2023	Duke Energy - Duke Customer Service Center
6/22/2023	Frontier Communications - Toni Cannon
6/22/2023	Zayo Group - Henry Klobucar (ATTEMPTED)

Utility Agency/Owner	Utility Builder (when applicable)
Signature: JOHN BOSTIC III (digital signature) Date: 10/2/2023	Signature: _____ Date: _____
Name (printed): JOHN BOSTIC III	Name (printed): _____
Title: _____	Title: _____

FDOT PROJECT INFORMATION

Pursuant to UAM Section 2.1(10), the utility work is within FDOT projects listed below and must have a Utility Work Schedule for each project approved prior to commencement of work within the FDOT project limits:

FDOT construction is proposed or underway. Refer to Financial Project Id: None.
This work is NOT related to an approved Utility Work Schedule.

FDOT SPECIAL INSTRUCTIONS

In accordance with UAM Section 2.7, FDOT incorporates the below and attached special instructions into this permit.

Contact FDOT James Meyer 48 hours before working in FDOT R/W 352-848-2610, to activate permit.

Provide MOT Technician “Name, Phone Number, Email Address”.

Any Damage to PED Trail to be repaired 10' in each direction of damage, entire

Additional FDOT Special Instructions are attached and incorporated into this permit. Yes ☑ No ☐

PERMIT APPROVAL

By signature below, FDOT gives permission to the UAO and /or Utility Builder to construct, operate, and maintain the utilities indicated in this Utility Permit in compliance with the UAM, all incorporated documents, and special instructions. Any changes to the approved work must be approved by the FDOT’s Approving Engineer and attached and incorporated into this permit in accordance with UAM Section 2.11.

Approving Engineer: James A. Meyer (digital signature) Date: 10/30/2023
Name: James A. Meyer
Title: MAINTENANCE MANAGER/PERMITS

Notification of Utility Work to be provided to: Telephone (352) 848-2600 ext. 2610 or Email: james.meyer@dot.state.fl.us

An FDOT Representative is required to be present on the worksite prior to commencement of work. Yes ☐ No ☑

Rep. Name: _____ Telephone _____ Email: _____

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

Florida Department of Transportation

UTILITY PERMIT

PERMIT NO: 2023-H-798-00203

CERTIFICATION

I, the undersigned UAO and/or Utility Builder, hereby CERTIFY that the utilities were constructed and inspected in compliance with the UAM all incorporated documents, and special instructions. Pursuant to UAM Section 2.11, all changes have been approved by the FDOT's Approving Engineer and incorporated into this permit along with all other material certifications, test results, bore logs, approved plans changes, as-built plans or other required documentation.

I also CERTIFY that work began on _____ and was completed on _____ and that the area was left in as good or better condition than when the work began.

Utility Agency/Owner	Utility Builder (when applicable)
Signature: _____ Date _____	Signature:_____ Date _____
Name (printed): _____	Name (printed): _____
Title: _____	Title: _____

FINAL INSPECTION OF WORK

☐ The work was inspected and found to be in non-compliance as noted below:

☐ All issues of non-compliance listed above have been brought into compliance and/or FDOT has no outstanding issues that need to be addressed by the UAO and/or Utility Builder. However, this final inspection does not release the UAO and/or Utility Builder of their continuing responsibilities pursuant to Rule 14-46.001, the UAM, all incorporated documents, and special instructions.

FDOT Inspector: _____ Date: _____

Name: _____

Title: _____

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

PERMIT NO.: 2023-H-798-00203

STATE ROAD INFORMATION:

NAME OF OTHER FACILITY OWNERS / DATE NOTIFIED:

Facility Name: Pasco County Traffic Operations Div. Venkat Vattikuti, Date Notified: 6/22/2023, Facility Name: Pasco County Utilities - George Demint, Date Notified: 6/22/2023, Facility Name: Teco - Joan Domnin, Date Notified: 6/22/2023

FDOT PROJECT INFORMATION:

FDOT construction is proposed or underway. Refer to Financial Project Id: None.
This work is NOT related to an approved Utility Work Schedule.

THE WORK WAS INSPECTED AND FOUND TO BE IN NON-COMPLIANCE AS NOTED BELOW:

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

PERMIT NO.: 2023-H-798-00203

The complete special instructions could not fit in the space allotted on Page 2 of the Utility Permit so they are displayed below.

Special FDOT Instructions

Contact FDOT James Meyer 48 hours before working in FDOT R/W 352-848-2610, to activate permit.

Provide MOT Technician “Name, Phone Number, Email Address”.

Any Damage to PED Trail to be repaired 10' in each direction of damage, entire width of the trail. Match existing.

FDOT R/W to be restored with sod only.

Sidewalks or PED Trail shall NOT be closed more than 2 weeks the duration of the permit. The contractor will need to provide accommodation for pedestrians.

Contact Scott Brown Pasco County for locates of lighting fiber and signal conduits Pasco County
727-849-6845

Full set of plans added just for reference. Sheets C-7 and C-10 are FDOT R/W work.

Enter in the FDOT’s One Stop Permitting – “Certify Construction Complete” or provide, original signed copy of Permit Application (pg. 3 of 3) and As-builts. Once construction is completed for permit close out.

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

143+00
144+00
145+00
146+00
147+00
148+00
BM #22
SET NAIL & DISK
"LD 451.4"
EL.: 129.2
KOSSIK ROAD
STORM INLET
TOP EL.: 126.85'
24" RCP(W) I.E.: 120.22'
24" RCP(E) I.E.: 120.11'
18" RCP(N) I.E.: 120.22'
STORM INLET
TOP EL.: 131.79'
24" RCP(W) I.E.: 120.60'
18" RCP(N) I.E.: 121.00'
18" RCP(E) I.E.: 120.67'
SIDEWALK
TOP OF BANK
ACCESS ROAD
EDGE OF PAVEMENT
BACK OF CURB
TOE OF SLOPE
RIGHT OF WAY LINE
WM
FM

R = 38,197.19'
P.C. STA. 451+58.03 (451+51.80)
P.T. STA. 470+76.98 (470+74.00)

G 8" FORCE MAIN
ZEPHYRHILLS

GALL BLVD

ASPHALT 10' IN EACH
N OF THE DAMAGE, ENTIRE
F THE TRAIL. MATCH EXISTING.

1-8" DI MJ SLEEVE
CONNECT TO EXISTING CAPPED
8"PLUG VALVE AND TEE

OPEN CUT

REMOVE & REPLACE
(±647 SY)
CONCRETE SIDEWALK

RIGHT OF WAY (TYP)

485 LF 8" FM-1

5' (TYP)

9' (TYP)

SANITARY MANHOLE
TOP EL.: 116.09'

STORM INLET
TOP EL.: 118.16'
30" RCP(S) I.E.: 112.27'
24" RCP(N) I.E.: 112.19'

STORM INLET
TOP EL.: 114.46'
18" RCP(N) I.E.: 110.57'
18" RCP(S) I.E.: 110.49'

STORM INLET
TOP EL.: 114.10'
18" RCP(S) I.E.: 110.82'

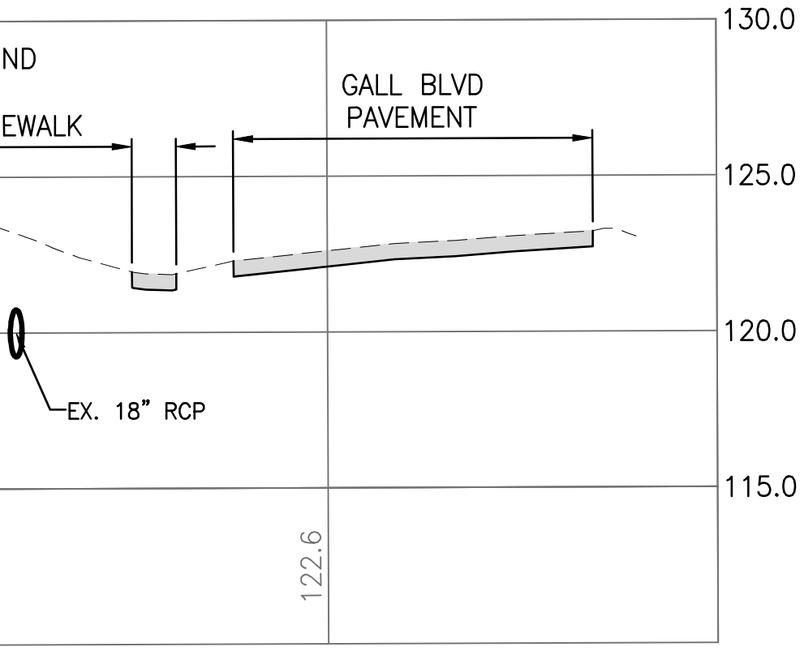
STORM INLET
TOP EL.: 112.26'
18" RCP(S) I.E.: 108.01'

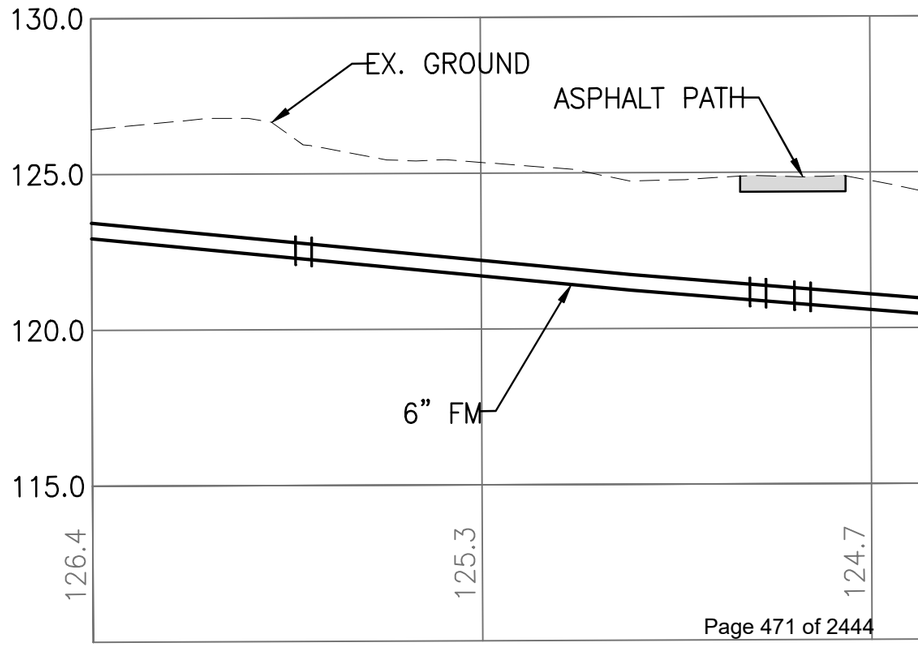
SET NAIL & DISK
"LB 4514"
EL.: 116.72'

ADA WARNING PADS
CONCRETE MEDIAN
CHAIN LINK FENCE
CONCRETE

253+00
254+00
255+00
256+00
257+00
258+00
259+00
153+00
154+00
155+00
156+00
157+00
158+00

202+00
203+00
204+00
205+00
206+00
207+00
208+00
OTIS ALLEN ROAD
SHEPPARD LANE
REMOVE & REPLACE (±34 SY) CONCRETE DRIVEWAY
REMOVE & REPLACE (±43 SY) CONCRETE DRIVEWAY
2-8" DI MJ 45° BEND
EXISTING 8" WATER MAIN
BM #522 SET NAIL & DISK "LB 4514" EL.: 98.35'
15" CMP(W) I.E.: 92.49'
15" CMP(E) I.E.: 93.36'
15" CMP(W) I.E.: 96.30'
15" CMP(E) I.E.: 96.19' (BROKEN)
15" CMP(W) I.E.: 98.58'
CHAIN LINK FENCE
ROLLING GATES
RIGHT-OF-WAY LINE
DRIVEWAY
SWALE
OHP
WM
FM
EDGE OF





SEE THE PERMIT - PART 2: Engineer responsible for inspection, PART 3: Completion date, PART 4: General Provisions, PART 5: Special Provisions.

SPECIAL PROVISIONS

This Permit subject to the following provisions, conditions and stipulations: This Permit issuances DOES NOT in any way approve the applicant's plan.

1. **Notification:** Contact the Florida Department of Transportation (FDOT) 48 hours before starting construction. (A pre-construction meeting and **liability insurance is required for all permits –see Permit Category, Permit page 1, part 1 Permit Information).**

   Contact: James Meyer, Permits Manager OR David Skrelunas Brooksville Operations Program Engineer
   16411 Spring Hill Dr. Brooksville, FL.34604 * 352- 848-2600 Monday -Thursday 7:00 A.M. to 5:30 P.M.
2. **Work and Material Standards -Specifications:** ***The FDOT standards, specifications and Permit take priority over the permittee's plans.*** All construction work and materials must (mandatory) be FDOT certified and in conformance with the latest edition of the FDOT *Standard Plans for Road and Bridge Construction (Standard Plans), Utility Accommodation Manual, Standard Specifications (Spec.s), Florida Design Manual* and *Flexible Pavement Design Manual for New Construction and Pavement Rehabilitation*.
3. **Maintenance of Traffic:** All Maintenance of Traffic (TTC) signs and markings (including for bicycles, sidewalks and pedestrians), for lane/road closures, detours and right of way work for construction and/or maintenance must be in conformance with the *Standard Plans 102 - 600 series (use appropriate SP for the work type - multi or two lanes, urban or rural roadways).* All work only during daytime unless otherwise approved, and off-peak work hours may be required. All night work or overnight MOT must be approved by the FDOT. Submit lane closure calculations as required. All MOT must be set up and maintained by a certified MOT work site safety supervisor.
4. **Driveway/Connection Design:** The driveway must be in conformance with the *Standard Plans 000-515* (Rural or Urban) including the radius, slopes and remove/replace the paved shoulder in front of the driveway (see Pavement Structure) to a matching roadway structural section. The driveway profile grade maximum is 10% for commercial and 28% for residential. Urban flared driveway with sidewalk must have the correct walkaround, flares, slopes, ramps and detectable warnings. See *Standard Plans 522-001, 522-002 and 000-515 sheets 2,3,4 of 7.*
5. **Roadway Widening Design:** All rural or urban roadway widening for more lanes in conjunction with a driveway must match existing roadway and slope (usually 2-3%) with a 11 feet wide outside paved shoulder (usually 5 feet wide with 6% slope paved and 6 feet wide 6% slope unpaved shoulder, left turn lane shoulders match existing median shoulders). The shoulder front ditch slope is usually 1 (rise) to 6 (run). Maintain clear recovery zone distances and if required use guardrails and handrails for excessive slopes and obstructions. The widening approach solid/skip striping pattern must be in conformance with *Standard Plan 711-001, sheet 5-14.*
6. **Drainage - Mitered End Sections:** All project drainage should be away from the FDOT roadway and right-of-way. The connection must drain away from the roadway for at least 5 feet. A Drainage Permit or exemption is required for any drainage work within or discharge to the FDOT right of way. The driveway and mitered end section *(Standard Plan 430-022)* including (correctly sized with beveled/radii corners and splash pads), pipe size and type, shoulder width and 1v:4h side slopes must be in conformance with *Standard Plan 430-022, 430-001 and 000-515.* All other drainage work and materials must be in conformance with F.D.M. and *Standard Plan 425-001 to 524-001*.
7. **Construction Stages –Time Period:** The permittee's engineer is responsible for inspection. All construction must be done in stages with each stage (for example) subgrade, base, etc. inspected and approved by the FDOT (or the inspection must be waived by the FDOT) before starting the next stage. Complete the construction in a timely manner and within one year of issuance as noted on the permit.
8. **Turn Lanes - Sight Distance:** The median opening and spacing, left turn lane transitions, queues and lengths must be in conformance with FDM. The sight distance and length must be in conformance with FDM.
9. **Signs and Striping:** All traffic signs, striping, raised pavement markers and pavement markings must be in conformance with FDOT Standard *Plan 11000 and 17000 series*. See *Standard Plan* for pavement markings, thermoplastic and traffic signs. Apply thermoplastic 14 days (no wait for concrete) after paving and apply interim striping until thermoplastic is applied. Remove existing striping by mill and resurface with matching asphalt (water blasting and grinding are not allowed). A rural commercial driveway must have at a minimum a high intensity reflective 36" R1-1 STOP sign with a 24" wide stop bar located between 12-25 feet away from the roadway.
10. **Sod and Erosion Control**: All areas in the right of way disturbed during construction must be restored, compacted, sodded and watered in conformance with the *Standard Specifications, Section 104* and *Standard Plan 570-001, 570-010.* Excess shoulder lime rock must be removed or mixed with a sufficient amount of soil and fertilizer to ensure growth. During construction install erosion control, silt fences, turbidity barriers etc. in conformance with *Standard Specifications, Section 104*, NPDES/DEP and SWPPP (Stormwater permit/plan) requirements.
11. **Pavement:** The mainline widening etc. (and the mainline shoulder in front of the connection must be removed and replaced), MUST match the mainline thickness, type of stabilization, base and structural course, friction course (FC), and aggregates etc. (course or fine graded), unless otherwise directed by the FDOT/engineer. Submit approved testing laboratory certification for the design mix and density test results. The density tests must be a minimum of 3 per section of widening for each lift, unless otherwise directed by the FDOT/engineer. The paving seam lines must align with striping, and if needed use compatible mill and overlay, resurface, leveling etc., over entire existing roadway to reduce old/new pavement joints. **Driveway Pavement:** The minimum driveway pavement section: (this driveway pavement is not for the mainline and does not replace a better or match existing pavement or as specified by the FDOT/engineer. For roadway widening see Pavement Design Manual design criteria; traffic volumes, rural/urban, multi/single lanes, loads, soil, speed etc.):

    A. Sub-base: Stabilized 12 inch below the base* or ***Skip to Option A-1***
    Base: 8-inch-thick primed lime rock (double course – 4-inch lifts) or B-12.5 (Superpave asphalt base) if required
    Surface: 1.5-inch-thick asphalt type SP or type S (and **FC shoulder as needed) (and/or match existing structural & FC)

    A-1. Sub-base: No sub grade is required
    Base: 12-inch-thick primed lime rock (6-inch lifts) * or B-12.5 (Superpave asphalt) if required (1.5 x 8" = 12" base)
    Surface: 1.5-inch-thick asphalt surface type SP or type S and **FC as needed (and/or match existing structural & FC)

    or B. Sub-base: No compaction specified*
    Base: 8-inch-thick Sand Asphalt Hot Mix (triple course – 3 lifts) 800 lb. stability
    Surface: 1.5-inch-thick asphalt type SP or type S and **FC as needed

    or C. 6-inch-thick of FDOT approved Class I 3000 psi concrete (6" for traffic bearing & 4" for sidewalk) on suitable soil with expansion joints as required. See *Standard Specifications 346 and 350*

    * The sub-base (stabilization) must extend 4 inches beyond the base above and/or the base must extend 4 inches beyond the pavement section above (or 4 inches beyond back of curb)
    **The FC may not be required on low volume/speed driveways beyond the mainline shoulder, providing the mainline and driveway surface difference ("lip") does not exceed the limit.
12. **Lime rock Base:** The lime rock base material must be from a FDOT approved source. At no time must a lift course thickness exceed 6 inches. The lime rock base must be in conformance with FDOT *Design Standards 514* and *Standard Specifications, Section 200.* The Type B-12.5 asphalt black base may be required by the FDOT to expedite work or for wet conditions etc.
13. **Site/Other Approvals/Permits**: The permittee must comply with all federal, state, county and local ordinances with proof of local site plan approval, Southwest Florida Water Management District and Turnpike District permits/approval, utility company notifications/locates and coordination with other FDOT projects etc. This connection must not be of any cost to the FDOT or interfere with other FDOT projects.
14. **Easements/Dedications:** The permittee/engineer must ensure that all easements and dedications are recorded and submitted to FDOT before final acceptance of the permit.
15. **Quality Control and Acceptance:** The permittee and/or permittee's engineer is/are responsible for inspecting the work and material's and meet all FDOT indices, standards, specifications, conditions, qualified/approved/certified products and provisions of the permit. Submit a *Record Drawings Report by Permittee's Professional Engineer* (FDOT form 850-040-19) and AS BUILTS (if needed). The permit issuance

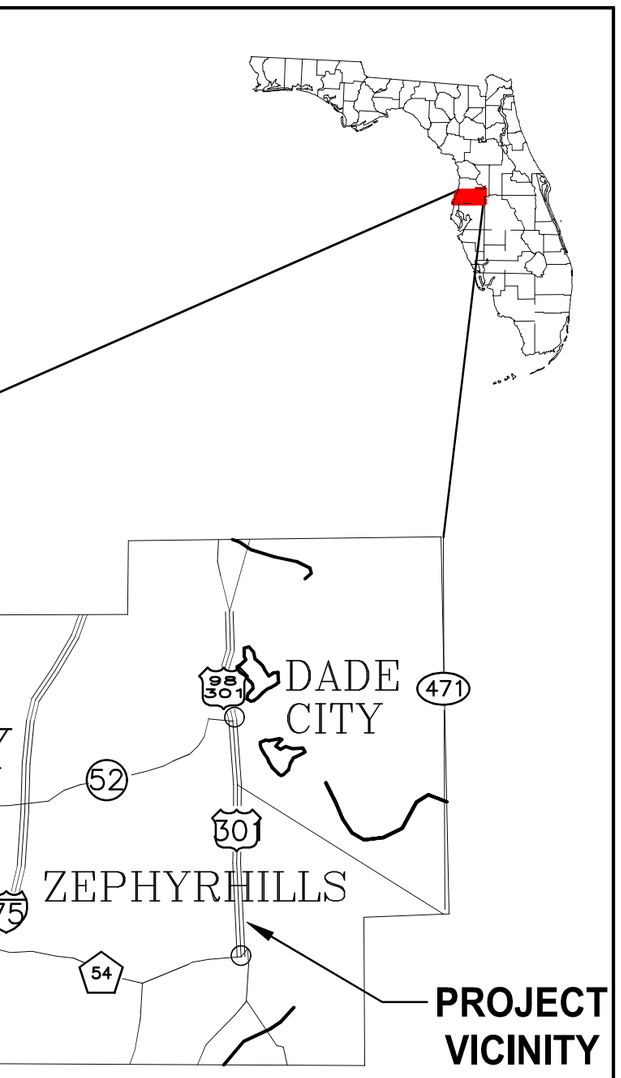
Authorized
Date: 08/08/2023
James A. Meyer
Authorized

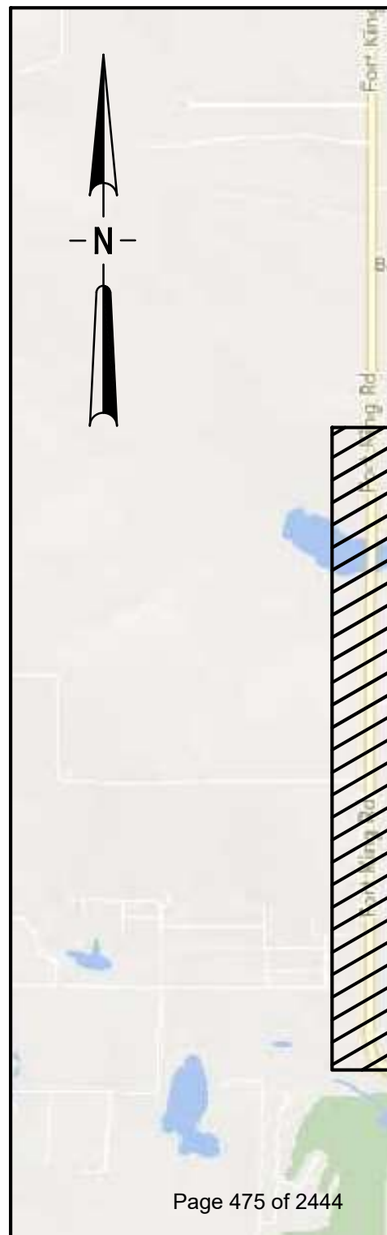
Approved
2023-H-798-00203
James A. Meyer
10/30/2023

does not relieve the permittee, contractor and engineer from complying with FDOT requirements. The FDOT must accept the driveway BEFORE the driveway may be used. G:\PermitACCESS\Brooksville Forms\Permit Attachments - FDOT Attach this for permit issueance\PERMIT ATTACHMENT Special Provisions.doc

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

PREPARED FOR:





PREPARED BY:

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING POWER/TELEPHONE COMPANIES AND ARRANGING TO HAVE UTILITIES POLES HELD AND/OR GUY WIRES REMOVED AND REPLACED, IF NECESSARY FOR CONSTRUCTION, AT NO ADDITIONAL COST TO THE OWNER.

SAFETY

17. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE FAMILIAR WITH THE OSHA EXCAVATION SAFETY STANDARDS AND TO ABIDE BY THEM AS COVERED UNDER THE FLORIDA TRENCH SAFETY ACT.

18. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION SAFETY.

RESTORATION

19. ALL PAVING, STABILIZED EARTH, DRIVEWAYS, CURBS, SIDEWALKS, FENCES, SOD, LANDSCAPING, CULVERTS, ETC. DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE RESTORED BY AND AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.

ACCESS/MAINTENANCE OF FACILITIES

20. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL EXISTING UTILITIES/FACILITIES AND MAINTAIN UNINTERRUPTED SERVICES THROUGHOUT THE CONTRACT PERIOD.

PIPING NOTES

21. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS. CONTRACTOR SHALL TAKE CARE TO PROVIDE PROPER GRADE ELEVATIONS AND ALIGNMENTS.

22. SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE. TYPE OF JOINT AND FITTING MATERIAL SHALL BE AS SPECIFIED FOR THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE.

23. CONTRACTOR SHALL CONSTRUCT NEW BELOW GRADE PIPING WITH A MINIMUM COVER OF 36". IF A MINIMUM COVER OF 36" CANNOT BE ACHIEVED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING.

24. CONTRACTOR SHALL INSTALL MINIMUM OF 1/4" THICK NEOPRENE PADDING BETWEEN PIPE AND SUPPORTS FOR DUCTILE IRON PIPE AND PIPE WITH COATINGS.

UTILITY SEPARATION

25. EACH PROPOSED UTILITY SHALL BE LAID TO ACHIEVE THE MINIMUM HORIZONTAL SEPARATION BETWEEN IT AND OTHER UTILITIES IN ACCORDANCE WITH THE TYPICAL UTILITY HORIZONTAL SEPARATION DETAIL AND FDEP REQUIREMENTS.

26. AT LOCATIONS WHERE A PROPOSED UTILITY CROSSES ANOTHER UTILITY, THE PROPOSED UTILITY SHALL BE INSTALLED IN ACCORDANCE WITH THE TYPICAL UTILITY CONFLICT DETAIL AND FDEP REQUIREMENTS.

REQUIRED.

33. PLEASE NOTE EXISTING UTILITIES AS SHOWN IN THE DRAWINGS ARE GIS DATA. CONTRACTOR SHALL VERIFY EXISTING UTILITIES LOCATIONS CONSTRUCTION.

SPECIAL REQUIREMENTS TO HAND-DIG EXCAVATIONS EXISTING UTILITY COORDINATION

34. PLEASE NOTE AREAS OF EXISTING UTILITIES IN CLOSE PROXIMITY TO THE INSTALLATION HAVE BEEN NOTED WITH DASHED RECTANGULAR BOXES SHO PLANS.

35. IN THE NOTED AREAS AND OTHER AREAS IDENTIFIED DURING CONSTRUCTIO CONTRACTOR SHALL HAND DIG ALL EXCAVATIONS WITHIN 10 FEET IN ALL OF A MARKED LOCATED UTILITY LINE.

36. THE CONTRACTOR SHALL ALSO HAND DIG A PILOT TRENCH WHEN CALLED DIG PERMIT FOR ALL UNDERGROUND UTILITY WORK ALONG THE CENTERLIN TRENCHES AND DOWN TO THE BOTTOM ELEVATION OF THE NEW UTILITY.

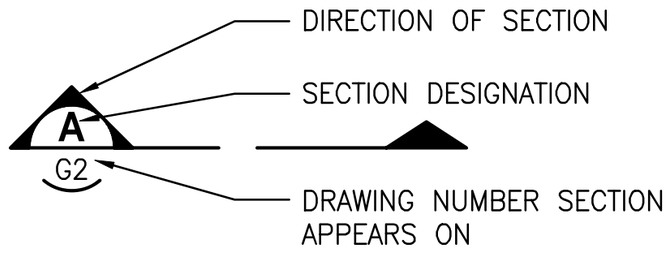
37. MACHINE EXCAVATION SHALL PROCEED ONLY AFTER IT IS DETERMINED THA EXISTING UTILITIES HAVE BEEN IDENTIFIED AND PROTECTED.

HORIZONTAL DIRECTIONAL DRILL NOTES

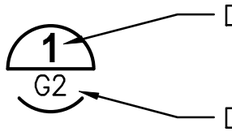
38. BORING LAYOUT BASED ON MINIMUM RADIUS OF 400 FEET. MAXIMUM BAC DIAMETERS SHALL BE
    13.6–INCH FOR 8–INCH DR–11 HDPE PIPE
    10.4–INCH FOR 6–INCH DR–11 HDPE PIPE

39. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNERS FOR ACCESS D INSTALLATION.

40. BORE DEPTH ON BORES BENEATH FDOT ROADWAY PAVEMENT SHALL BE 1 REAMER SIZE PER UAM 3.16.9.1.



SECTION DESIGNATION



DETAIL

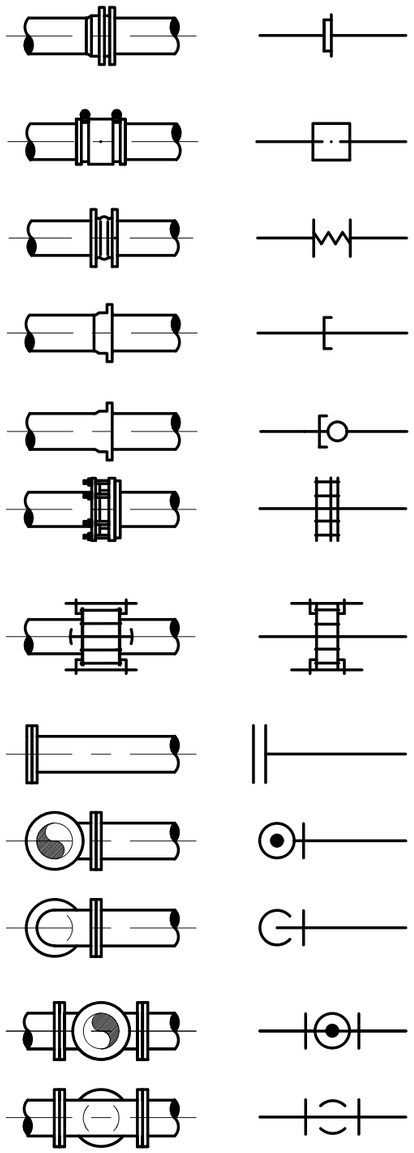
CT CURRENT
GNATION
IL
TILE IRON
ETER
TILE IRON PIPE
TILE IRON PIPE SIZE
ION
N, DAMPER
NSION RATIO
WING
BLE EXTRA STRONG
(ING)

ENTRIC
RGENCY EYEWASH AND SHOWER
FACE, EXHAUST FAN
H AS
ANSION JOINT
ATION
W
TRICAL
OF PAVEMENT
AL
PTICAL REINFORCED CONCRETE PIPE
ATED STORAGE TANK
TERA
WAY
TING
IDA BUILDING CODE
HED FLOOR
ICATED
IDA ADMINISTRATIVE CODE
GED COUPLING ADAPTER
CONTROL VALVE
IDA DEPARTMENT OF ENVIRONMENTAL
TECTION
NDATION
IDA DEPARTMENT OF TRANSPORTATION
ER
ELEMENT
HED FLOOR
HED FLOOR ELEVATION
HED GRADE, FIBERGLASS
HYDRANT
RE
HED
INDICATING TRANSMITTER
GED JOINT
R

HA	HAND AUGER
HD	HAND
HDD	HORIZONTAL DIRECTIONAL DRILL
HDNS	HARDNESS
HDPE	HIGH DENSITY POLYETHYLENE
HHWL	HIGH HIGH WATER LEVEL
HK	HOOK
HOA	HAND–OFF–AUTO
HOR	HAND–OFF–REMOTE
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HR	HANDRAIL
HSP	HIGH SERVICE PUMP
HT	HEIGHT
HWL	HIGH WATER LEVEL
I&C	INSTRUMENTATION AND CONTROL
IC	INTERRUPTING CAPACITY
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
IF	INSULATED FLANGE
IJ	ISOLATION JOINT
INC	INCORPORATED
IPS	IRON PIPE SIZE
J, JB	JUNCTION BOX
JT	JOINT
KA	KILOAMPERES
KB	KNEE BRACE
KCMIL	THOUSAND CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT AMPERES
KW	KILOWATTS
KWH	KILOWATT HOUR
L	LOWER
LB, LBS	POUND(S)
LE	LEVEL ELEMENT
LEL	LOWER EXPLOSIVE LIMIT
LF	LINEAR FEET
LG	LONG
LIT	LEVEL INDICATING TRANSMITTER
LIU	LIGHT INTERFACE UNIT
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LLWL	LOW LOW WATER LEVEL
LOS	LOCKOUT STOP
LR	LONG RADIUS, LOCAL–REMOTE
LS	LIFT STATION
LSIG	LONG SHORT INSTANTANEOUS GROUND
LWL	LOW WATER LEVEL
M	MAGNETIC CONTACTOR COIL, MOTOR,

NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NPT	NATIONAL PIPE THREAD
NPW	NON POTABLE WATER
NRS	NONRISING STEM
NS	NEAR SIDE
NSF	NATIONAL SANITATION FOUNDATION
NTS	NOT TO SCALE
NW	NORTH WEST
OC	ON CENTER(S), OPEN–CLOSE(D)
OCA	OPEN–CLOSE–AUTO
OCR	OPEN–CLOSE–REMOTE
OD	OUTSIDE DIAMETER
OF	OVERFLOW
OO	ON–OFF
OOA	ON–OFF–AUTO
OOR	ON–OFF–REMOTE
OPP	OPPOSITE
ORP	OXIDATION REDUCTION POTENTIAL
OS&Y	OUTSIDE STEM AND YOKE
OSC	OPEN–STOP–CLOSE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
P&ID	PIPING AND INSTRUMENTATION DIAGRAM
P/L	PROPERTY LINE
PB	PULL BOX
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PCV	PRESSURE CONTROL VALVE
PE	PLAIN END, POLYETHYLENE
PET	POLYETHYLENE TUBING
PF	POWER FACTOR
pH	HYDROGEN ION CONCENTRATION
PH	PHASE
PI	POINT OF INTERSECTION/PLANT INFLUENT
PID	PROPORTIONAL INTEGRAL DERIVATIVE
PIT	PRESSURE INDICATING TRANSMITTER
PIV	POST INDICATOR VALVE
PL	PLATE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PLCS	PLACES
POC	POINT OF CONNECTION
POE	POINT OF ENTRY
POJ	PUSH ON JOINT
PP	POWER POLE

RT	RIGHT
RTU	REMOTE TELEMETRY UN
SARV	SURGE ANTICIPATOR RE
SBC	STANDARD BUILDING CO
SCH	SCHEDULE
SCJ	SAW CUT JOINT
SDI	STEEL DECK INSTITUTE
SE	SOUTH EAST
SEC	SECOND
SF	SLOWER–FASTER
SHEC	SHOULDERED–END COU
SHT	SHEET
SIM	SIMILAR
SJI	STEEL JOINT INSTITUTE
SM	STATIC MIXER
SP	SPACING, SPACED
SPD	SURGE PROTECTIVE DEV
SQ	SQUARE
SR	STATE ROAD, SURGE RE
SRV	SURGE RELIEF VALVE
SS	START–STOP
SS, SST	STAINLESS STEEL
SSC	SUPERVISORY SET POIN
SSRV	SOLID STATE REDUCED
ST	SHUNT TRIP
STA	STATION
STD	STANDARD
STL	STEEL
STS	STORMWATER SEWER
SW	SOUTH WEST, SWITCH
SWD	SIDE WATER DEPTH
SWJ	SOLVENT WELD JOINT
SWPPP	STORM WATER POLLUTIO
SY	SQUARE YARD
T, THK	THICK
T/	TOP OF
T/B,T&B	TOP AND BOTTOM
TBM	TEMPORARY BENCHMARK
TEMP	TEMPERATURE
TGS	THREADED GALVANIZED
TGSP	THREADED GALVANIZED
TH	TOTAL HEAD
THERMO	THERMOSTATIC
THD	THREADED
TJB	TERMINAL JUNCTION BO
TK	TANK
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TOSJ	TOP OF STEEL JOIST
TOW	TOP OF WALL
TS	TUBULAR STEEL



MECHANICAL JOINT OR
RESTRAINED PUSH–ON JOINT

FLEXIBLE COUPLING ADAPTER

EXPANSION JOINT

HUB & SPIGOT JOINT

BALL JOINT

FLANGED COUPLING ADAPTER
W/ THRUST TIES

FLEXIBLE COUPLING WITH
THRUST TIES

BLIND FLANGE

ELBOW UP

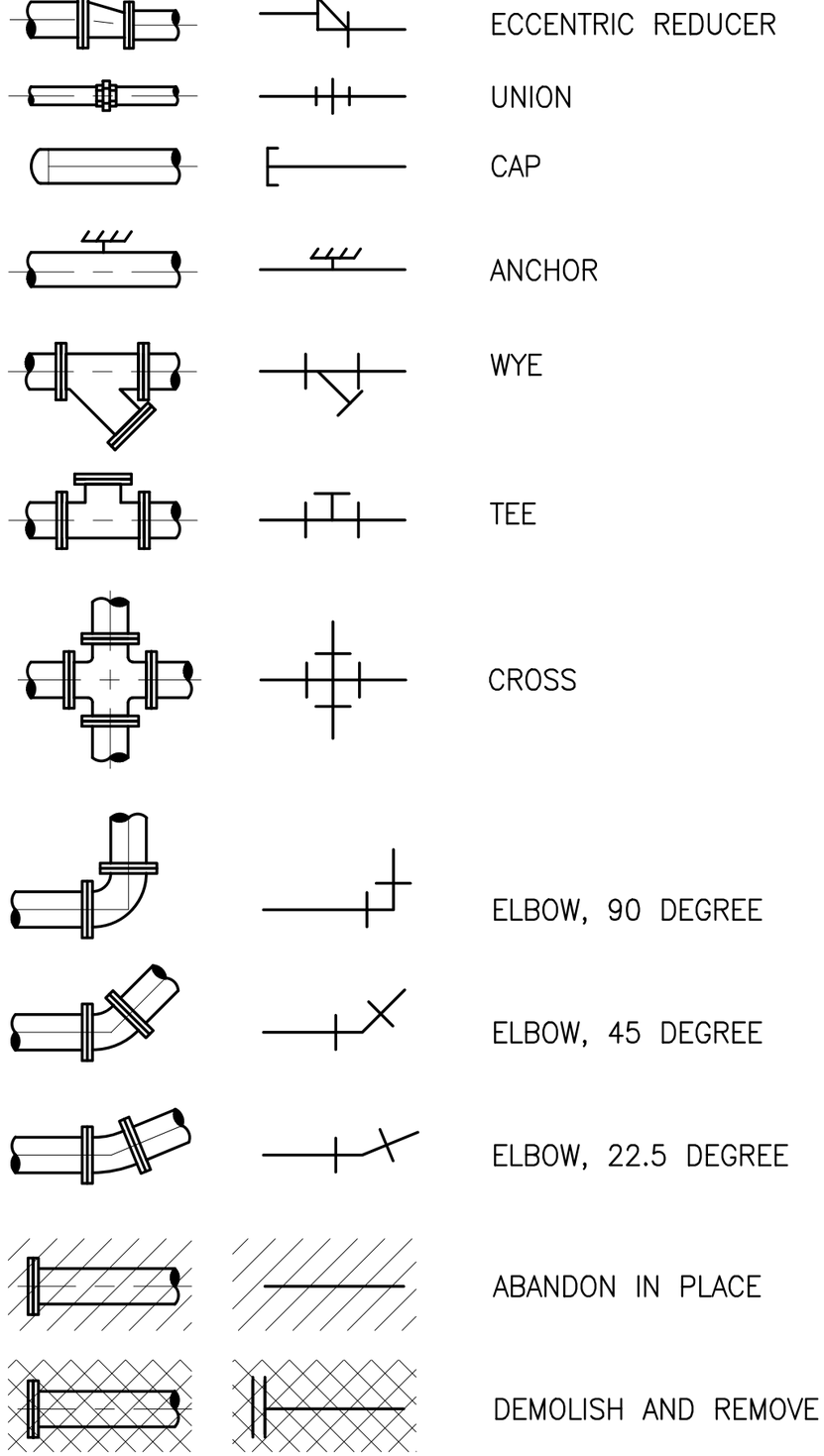
ELBOW DOWN

TEE UP

TEE DOWN

FEMALE QUICK DISCONNECT FITTING

MALE QUICK DISCONNECT FITTING



ECCENTRIC REDUCER

UNION

CAP

ANCHOR

WYE

TEE

CROSS

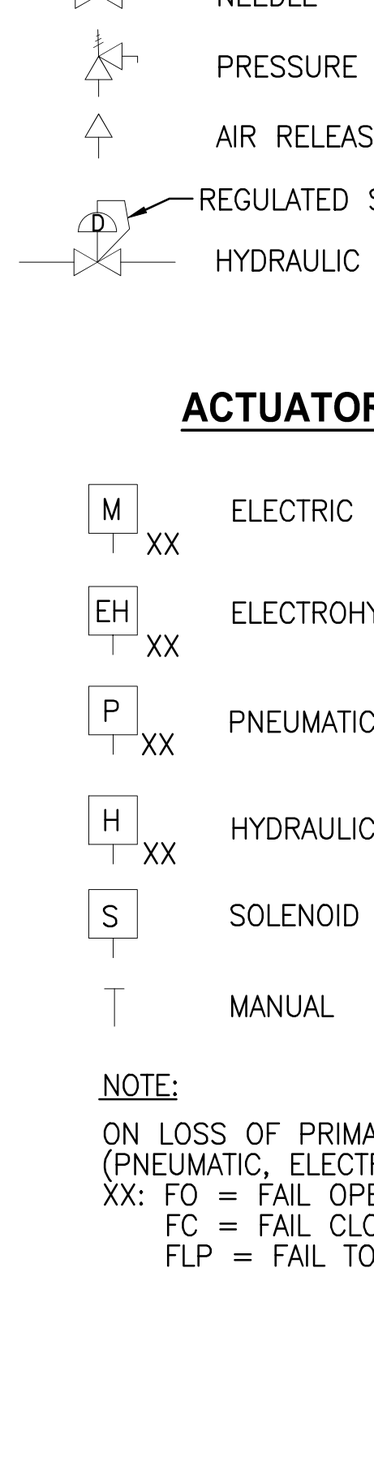
ELBOW, 90 DEGREE

ELBOW, 45 DEGREE

ELBOW, 22.5 DEGREE

ABANDON IN PLACE

DEMOLISH AND REMOVE



NOTE:

ON LOSS OF PRIMA
(PNEUMATIC, ELECTR
XX: FO = FAIL OPE
FC = FAIL CLO
FLP = FAIL TO

PIPE SCHEDULE

HALL BE CONSTRUED TO GIVE ANY RIGHTS OR
TO ANYONE OTHER THAN THOSE CERTIFIED TO. THIS
EETS THE "STANDARDS OF PRACTICE" SET FORTH BY
DA BOARD OF LAND SURVEYORS IN CHAPTER 5J-17
DMINISTRATIVE CODE.

VEY WAS PREPARED WITHOUT AN ABSTRACT OF TITLE;
E THE UNDERSIGNED MAKES NO GUARANTEES OR
TATIONS REGARDING INFORMATION SHOWN HEREON
G TO EASEMENTS, RIGHTS-OF-WAY, SETBACK LINES,
TS, RESERVATIONS, OR OTHER SIMILAR MATTERS.

UMENTS OF RECORD REFLECTING EASEMENTS,
-WAYS AND/OR OWNERSHIP WERE FURNISHED TO
RSIGNED EXCEPT AS SHOWN.

RGROUND INSTALLATIONS, IMPROVEMENTS OR
MENTS, HAVE BEEN LOCATED EXCEPT THOSE SHOWN

S SHOWN HEREON ARE BASED UPON NORTH
VERTICAL DATUM OF 1988 (NAVD88), NATIONAL
SURVEY BENCHMARK "V 662", LOCATED ALONG GALL
D IN ZEPHYRHILLS, FL, PUBLISHED ELEVATION =
NAVD88).

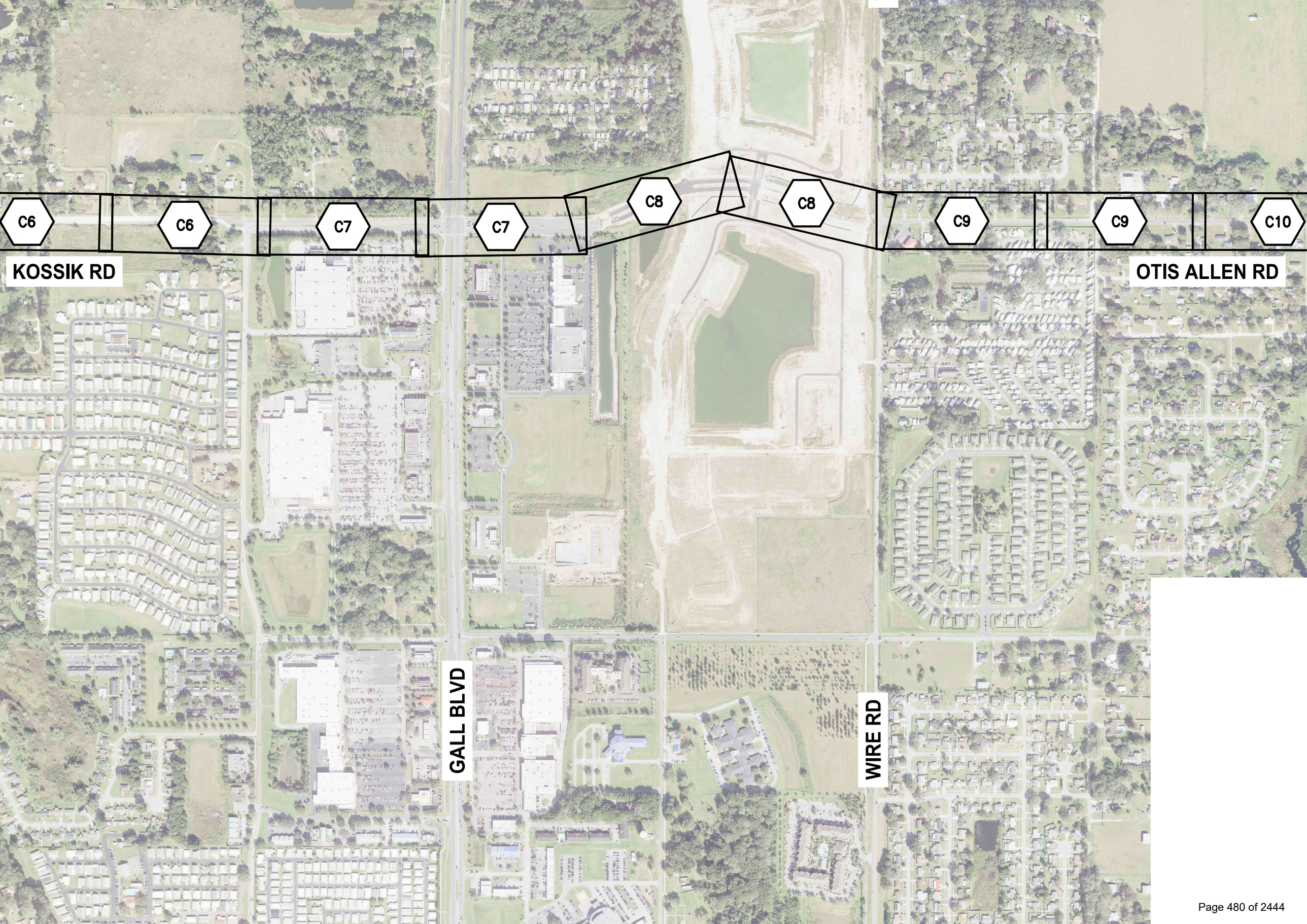
AND DISTANCES SHOWN HEREON ARE FIELD
, UNLESS OTHERWISE INDICATED.

FOR TIES TO IMPROVEMENTS INDICATES THE
THEY LIE IN RELATION TO THE BOUNDARY.

PROPERTY MAY CONTAIN LANDS THAT ARE SUBJECT
DICTION OR RESTRICTION BY ONE OR MORE OF THE
G AGENCIES: ARMY CORP. OF ENGINEERS,
T FLORIDA WATER MANAGEMENT DISTRICT
.D.) OR FLORIDA DEPARTMENT OF ENVIRONMENTAL
N (F.D.E.P.).

PG. = PAGE
EL. = ELEVATION
I.E. = INVERT ELEVATION
T.C. = TOP OF CURB
E.P. = EDGE OF PAVEMENT
PVC = POLY-VINYL CHLORIDE PIPE
RCP = REINFORCED CONCRETE PIPE
CMP = CORRUGATE METAL PIPE
HDPE = HIGH-DENSITY POLYETHYLENE PIPE
= SET 5/8" IR "DC JOHNSON LB 4514"
= SET NAIL & DISK "LB 4514"
= VERTICAL CONTROL BENCHMARK
= POWER POLE/TELEPHONE POLE
= LIGHT POLE
= GUY ANCHOR
= BOLLARD
= ROADSIGN
= REFLECTOR SIGN
= MAILBOX
= CLEANOUT
= CHAIN LINK FENCE
= VINYL FENCE
= WIRE FENCE
= WOOD FENCE
91.5' = SPOT ELEVATION
= CAMPHOR TREE (SIZE AS NOTED)
= CHERRY LAUREL TREE (SIZE AS NOTED)
= MAGNOLIA TREE (SIZE AS NOTED)
= OAK TREE (SIZE AS NOTED)
= PALM TREE (SIZE AS NOTED)
= PINE TREE (SIZE AS NOTED)

= GATE VALVE -
= AIR RELEASE VAL
W = WATER METER
W = GATE VALVE - W
= AIR RELEASE VAL
= WATER LINE WITN
= FIRE HYDRANT
= FIRE DEPARTMEN
F = GATE VALVE - FIR
R = RECLAIMED WATE
R = GATE VALVE - R
= BACKFLOW PREVE
= UTILITY VAULT/HA
= GATE VALVE
= AIR RELEASE VAL
= ELECTRIC METER
= ELECTRIC BOX
= ELECTRIC TRANSF
OHP OHP = OVERHEAD POWE
G = GAS VALVE
= GAS LINE WITNES
= TELEPHONE EQUI
= TELEPHONE PEDE
= TELEPHONE LINE
FO = FIBER OPTIC VAU
= FIBER OPTIC WIT
= TRAFFIC SIGNAL
= PEDESTRIAN SIGN
TC = TRAFFIC CONTRO
TC = TRAFFIC CONTRO
TC TC = TRAFFIC CONTRO
= ASPHALT
= CONCRETE
= GRAVEL/DIRT RO


C6
C6
C7
C7
C8
C8
C9
C9
C10
KOSSIK RD
OTIS ALLEN RD
GALL BLVD
WIRE RD

FT. KING ROAD

3+00 4+00 5+00 6+00 7+00 8+00

102+00 103+00 104+00 105+00 106+00 107+00

746 LF 6" FM-1

REMOVE & REPLACE (24± SY) CONCRETE DRIVEWAY

RIGHT OF WAY (TYP)

OPEN CUT

HDD

1-6" DI MJ TEE
2-6" DI PLUG VALVE
2-6" HDPE TO MJ FUSIBLE ADAPTER
2-6" DI MJ 11.25° BEND
1-6" DI MJ CAP
6" DR-18 PVC SPOOL PIPE
1-ARV ASSEMBLY
SEE PIPE TRANSITION DETAIL 1 C15

606 LF 6" FM-2 2 C11

DRILL PIT

HDD

HDD

FT. KING ROAD

13+00 14+00 15+00 16+00 17+00 18+00

112+00 113+00 114+00 115+00 116+00 117+00

WATERSIDE DRIVE

EXISTING 12" WM
CITY OF ZEPHYRHILLS

RIGHT OF WAY (TYP)

1-6"DI MJ 45° BEND

1-6" DI MJ 45° BEND

1-6" DI MJ TEE
2-6" DI PLUG VALVE
1-6" HDPE TO MJ FUSIBLE ADAPTER
1-6" DI MJ 11.25° BEND
1-6" DI MJ CAP
SEE PIPE TRANSITION DETAIL 1/C15

455 LF 6" FM-1

10' (TYP)

RIGHT OF WAY (TYP)

HDD

1-2" ARV ASSEMBLY

200'

31' (TYP)

DRILL PIT

1-6" DI MJ TEE
3-6" DI PLUG VALVE
1-6" HDPE TO MJ FUSIBLE ADAPTER
1-6" DI MJ 11.25° BEND

FT. KING ROAD

EXISTING 12" WM
CITY OF ZEPHYRHILLS

KYLE DRIVE

4'

1-6" DI MJ 45° BEND

1015 LF 6" FM-1

6'-6"

RIGHT OF WAY (TYP)

1-ARV ASSEMBLY

1000 LF 6" FM-1

FT. KING ROAD

RIGHT OF WAY

1-6" DI MJ TEE
2-6" DI PLUG VALVE
1-6" HDPE TO MJ FUSIBLE ADAPTER
1-6" DI MJ 11.25° BEND
1-6" DI MJ CAP
1-ARV ASSEMBLY
SEE PIPE TRANSITION DETAIL 1/C15

PRICE DRIVE

REMOVE & REPLACE (21± SY) CONCRETE DRIVEWAY

EXISTING 12" WM CITY OF ZEPHYRHILLS

DRILL PIT

366 LF 6" FM-2

3/C12

FT. KING ROAD

OPEN CUT

HDD

RIGHT OF WAY (TYP)

FT. KING ROAD

REMOVE & REPLACE
(21± SY)
CONCRETE DRIVEWAY

REMOVE & REPLACE
(14± SY)
CONCRETE DRIVEWAY

REMOVE & REPLACE
(26± SY)
CONCRETE DRIVEWAY

RIGHT OF WAY (TYP)

REMOVE & REPLACE
(15± SY)
CONCRETE DRVIEWAY

HDD

HDD

SUNSHINE ROAD

1'-6"

1-6" DI MJ TEE
2-6" DI PLUG VALVE
1-6" HDPE TO MJ FUSIBLE ADAPTER
1-6" DI MJ 11.25° BEND
1-6" DI MJ CAP
1-ARV ASSEMBLY
SEE PIPE TRANSITION DETAIL 1/C15

251 LF 6" FM-2

4/C12

TEMPLE AVE.

BM #15
SET NAIL & DISK
"LB 4514"
EL.: 90.29

EXISTING 12" WM
CITY OF ZEPHYRHILLS

EXISTING 2" WM
CITY OF ZEPHYRHILLS

FT. KING ROAD

RIGHT OF WAY (TYP)

DRILL PIT

HDD

6'
(TYP)

1-6" DI
2-6" DI
2-6" DI

1-6"DI MJ 22.5° BEND

6' MIN SEPARATION

DRILL PIT

HDD

OPEN CUT

600 LF 6" FM-1

2+00

104+00

105+00

106+00

107+00

108+00

STEEL SHED

SURVEY - No.2

WOOD BOARD FENCE

RIGHT-OF-WAY LINE

TOE OF SLOPE

TOP OF BANK

REMOVE & REPLACE (±79 SY) CONCRETE DRIVEWAY

1000 LF 12" WM-1

DAR LANE

12" GATE VALVE

RIGHT OF WAY (TYP)

BM #16
SET 5/8" IRON ROD
"D.C. JOHNSON LB 4514"
EL : 109.17'

KOSSIK ROAD

213+00

214+00

215+00

216+00

217+00

218+00

219+00

113+00

114+00

116+00

117+00

118+00

1000 LF 6" FM-1

REMOVE & REPLACE (±18 SY) CONCRETE DRIVEWAY

CHAIN LINK FENCE

GATE

GRADE BREAK

TOP
ERT.
TION
&
Y)
AY
" GATE VALVE
12" DI MJ 45° BENDS
123+00
124+00
125+00
126+00
127+00
128+00
WM
106 LF
12" WM-1
3'-6"
WAYFARER
DRIVE
CHAIN LINK FENCE
OHP
690 LF
12" WM-1
6'-6"
RIGHT-OF-WAY LINE
REMOVE &
REPLACE (±20 SY)
DIRT ROADWAY
RIGHT
OVE & REPLACE
1 SY) CONCRETE
VEWAY
REMOVE & REPLACE
(±21 SY) CONCRETE
DRIVEWAY
REMOVE & REPLACE
(±16 SY) CONCRETE
DRIVEWAY
REMOVE & REPLACE
(±13 SY) CONCRETE
DRIVEWAY
REMOVE & REPLACE
(±12 SY) CONCRETE
DRIVEWAY
6" DI MJ 11.25°
RIGHT OF WAY (TYP)
1002 LF
6" FM-1
WOOD BOARD FENCE
GATE
DRIVEWAY
233+00
234+00
235+00
236+00
237+00
238+00
239+00
FM
TOP OF BANK
EDGE OF PAVEMENT
8'
(TYP)
KOSSIK ROAD
TOE OF SLOPE
133+00
134+00
135+00
136+00
137+00
138+00
86'
BM #21
SET 5/8" IRON ROD
"D.C. JOHNSON
LB 4514"
EL.: 119.08'
BM #20
SET NAIL & DISK
"LB 4514"
EL.: 117.92'
BACK OF CURB
SWALE
2-
WM

143+00
144+00
145+00
146+00
147+00
148+00
BM #22
SET NAIL & DISK
"LB 4514"
EL.: 129.2
KOSSIK ROAD
STORM INLET
TOP EL.: 126.85'
24" RCP(W) I.E.: 120.22'
24" RCP(E) I.E.: 120.11'
18" RCP(N) I.E.: 120.22'
STORM INLET
TOP EL.: 131.79'
24" RCP(W) I.E.: 120.60'
18" RCP(N) I.E.: 121.00'
18" RCP(E) I.E.: 120.67'
SIDEWALK
TOP OF BANK
ACCESS ROAD
EDGE OF PAVEMENT
BACK OF CURB
TOE OF SLOPE
RIGHT OF WAY LINE
WM
FM

R = 38,197.19'
P.C. STA. 451+58.03 (451+51.80)
P.T. STA. 470+76.98 (470+74.00)

G 8" FORCE MAIN
ZEPHYRHILLS
115.00'
& REPLACE (±15 SY)
TE SIDEWALK
GALL BLVD
1-8" DI MJ SLEEVE
CONNECT TO EXISTING CAPPED
8"PLUG VALVE AND TEE
REMOVE & REPLACE
(±647 SY)
CONCRETE SIDEWALK
RIGHT OF WAY (TYP)
485 LF 8" FM-1
5'
(TYP)
9'
(TYP)
OPEN CUT
SANITARY MANHOLE
TOP EL.: 116.09'
CHAIN LINK FENCE
ADA WARNING PADS
CONCRETE MEDIAN
STORM INLET
TOP EL.: 118.16'
30" RCP(S) I.E.: 112.27'
24" RCP(N) I.E.: 112.19'
STORM INLET
TOP EL.: 114.46'
18" RCP(N) I.E.: 110.57'
18" RCP(S) I.E.: 110.49'
STORM INLET
TOP EL.: 112.26'
18" RCP(S) I.E.: 108.01'
SET NAIL & DISK
"LB 4514"
EL.: 116.72'
253+00
254+00
255+00
256+00
257+00
258+00
259+00
153+00
154+00
155+00
156+00
157+00
158+00
KOSSIK ROAD

EXISTING 6" WATER MAIN

KOSSIK ROAD

REMOVE & REPLACE (±70 SY) ASPHALT PAVEMENT

1 C19

CONNECT TO EXISTING 6" FM SEE C19 FOR CONNECTION DETAIL

EXISTING 6" RECLAIMED WATER MAIN

843 LF 8" FM-1

RIGHT OF WAY (TYP)

OPEN CUT

DRILL PIT

REMOVE & REPLACE
(±12 SY) CONCRETE
DRIVEWAY

888 LF 8" FM-1

OTIS ALLEN ROAD

28'
(TYP)

183+00 184+00 185+00 186+00 187+00 188+00

EDGE OF PAVEMENT

SET "LB 4514"
EL.: 85.60'

RIGHT-OF-WAY LINE

CHAIN LINK FENCE

VINYL FENCE

SURVEY No.2

DRIVEWAY

SWALE

15" RCP(E) I.E.: 84.28

15" RCP(E) I.E.: 83.47

15" RCP(W) I.E.: 82.60

15" CMP(W) I.E.: 82.97

15" RCP(E) I.E.: 83.08

15" RCP(W) I.E.: 83.12

15" RCP(E) I.E.: 83.17

18" RCP(E) I.E.: 83.97

15" RCP(E) I.E.: 94.97

E ADAPTER

AIL 1 C15

995 LF 8" FM-1

CASS ROAD

REMOVE & REPLACE
(±25 SY) CONCRETE
DRIVEWAY

REMOVE & REPLACE
(±16 SY) CONCRETE
DRIVEWAY

REMOVE & REPLACE
(±13 SY) ASPHALT
DRIVEWAY

3'
(TYP)

293+00 294+00 295+00 296+00 297+00 298+00 299+00

193+00 194+00 195+00 196+00 197+00 198+00

WOOD BOARD FENCE

EDGE OF PAVEMENT

OTIS ALLEN ROAD

16TH ST

15" CMP(E) I.E.: 82.19'

15" CMP(W) I.E.: 82.23'

12" PVC(E) I.E.: 83.29'

12" PVC(W) I.E.: 83.44'

15" CMP(W) I.E.: 82.97'

15" CMP(E) I.E.: 87.16'

15" RCP(W) I.E.: 82.60'

15" RCP(E) I.E.: 84.79'

15" RCP(W) I.E.: 85.29'

15" RCP(E) I.E.: 86.02'

18" RCP(W) I.E.: 81.75'

18" RCP(E) I.E.: 81.79'

RM #31
SET NAIL & DISK
"LB 4514"
EL.: 87.09'

RIGHT-OF-WAY LINE

VINYL FENCE

CHAIN LINK FENCE

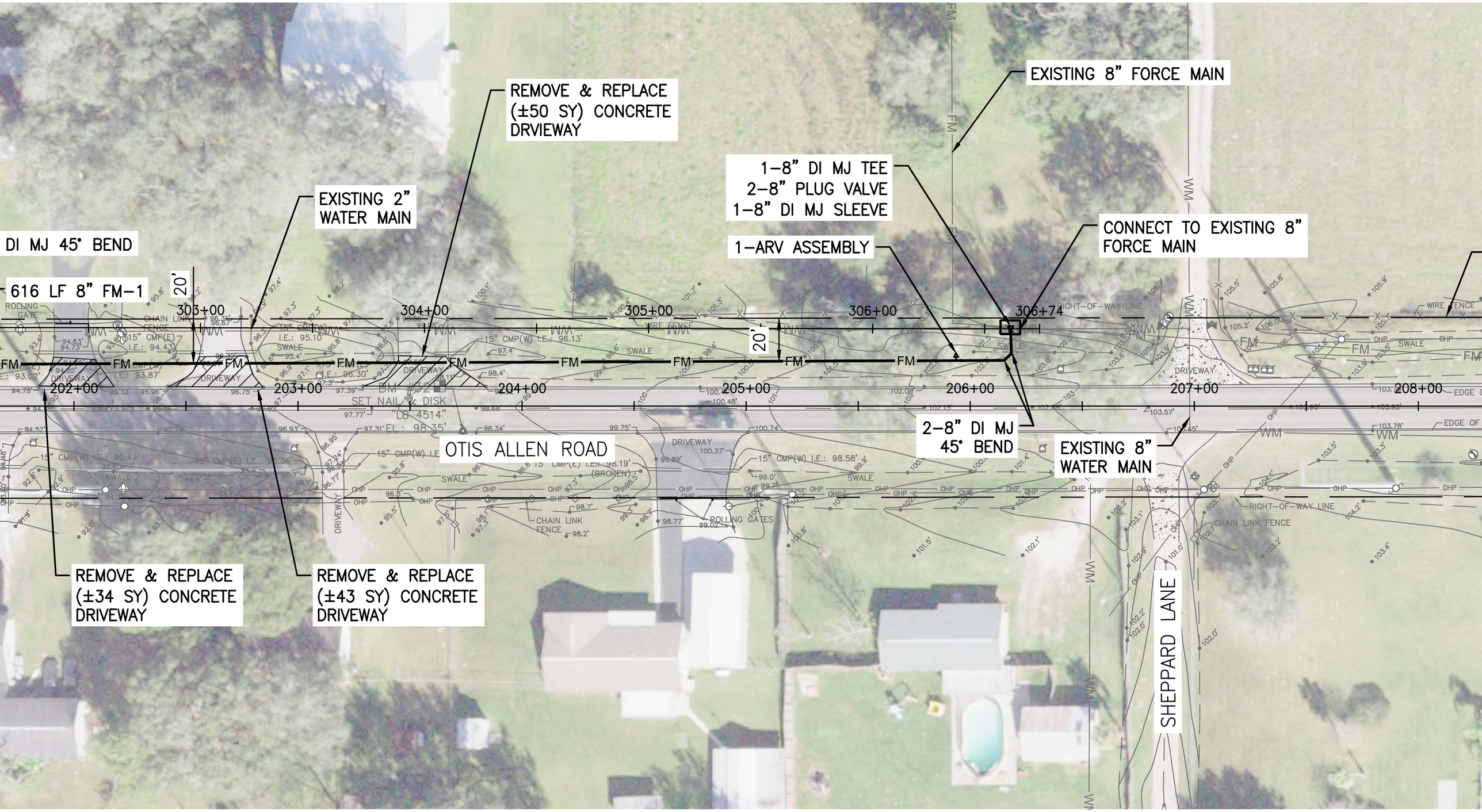
SWALE

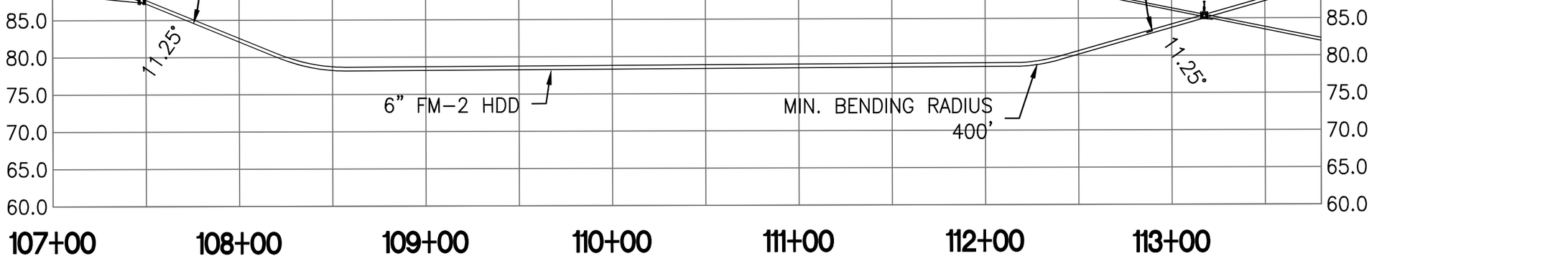
DRIVEWAY

GATE

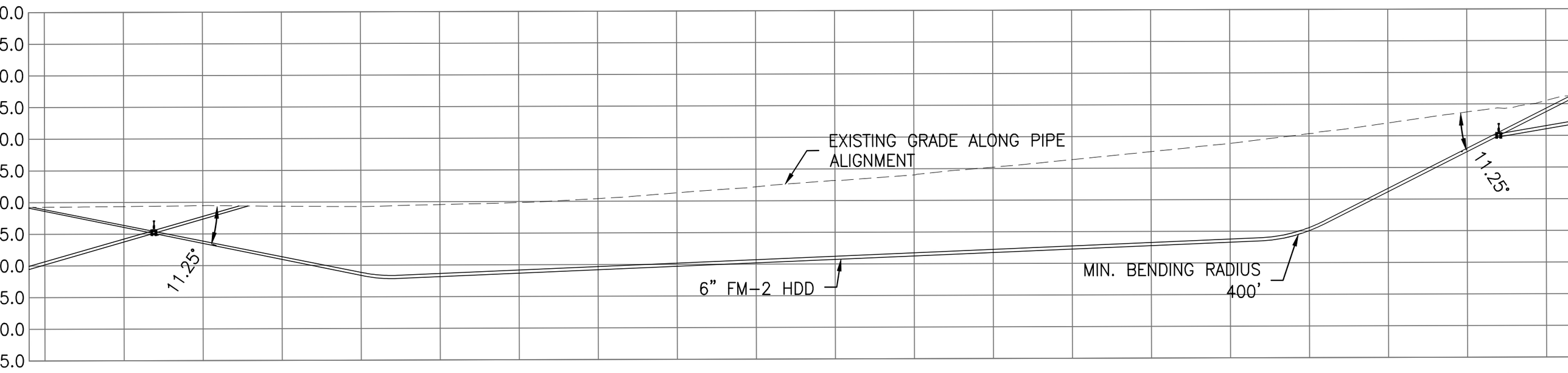
RIGHT

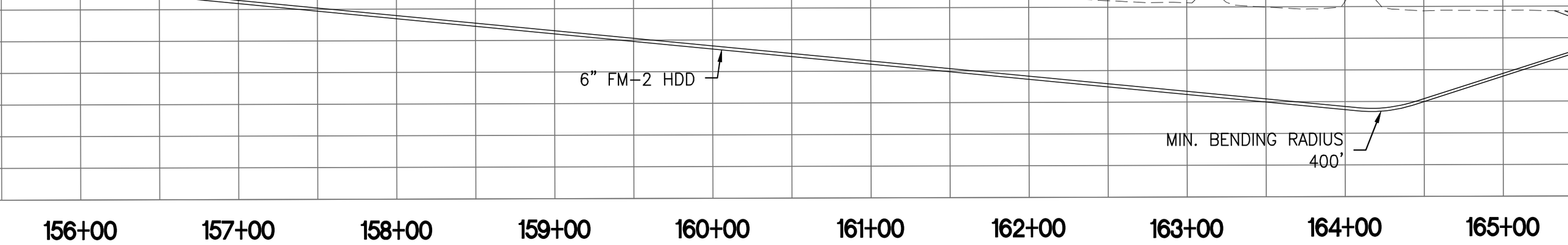
REMOVE &
(±43 SY)
DRIVEWAY


DI MJ 45° BEND
616 LF 8" FM-1
20'
303+00
304+00
305+00
306+00
306+74
202+00
203+00
204+00
205+00
206+00
207+00
208+00
REMOVE & REPLACE (±34 SY) CONCRETE DRIVEWAY
REMOVE & REPLACE (±43 SY) CONCRETE DRIVEWAY
EXISTING 2" WATER MAIN
REMOVE & REPLACE (±50 SY) CONCRETE DRVIEWAY
1-8" DI MJ TEE
2-8" PLUG VALVE
1-8" DI MJ SLEEVE
1-ARV ASSEMBLY
EXISTING 8" FORCE MAIN
CONNECT TO EXISTING 8" FORCE MAIN
2-8" DI MJ 45° BEND
EXISTING 8" WATER MAIN
OTIS ALLEN ROAD
SHEPPARD LANE
BM #321 SET NAIL & DISK "LB 4514" EL.: 98.35'
ROLLING GATE
CHAIN LINK FENCE
WIRE FENCE
RIGHT-OF-WAY LINE
ROLLING GATES
DRIVEWAY
SWALE
EDGE OF

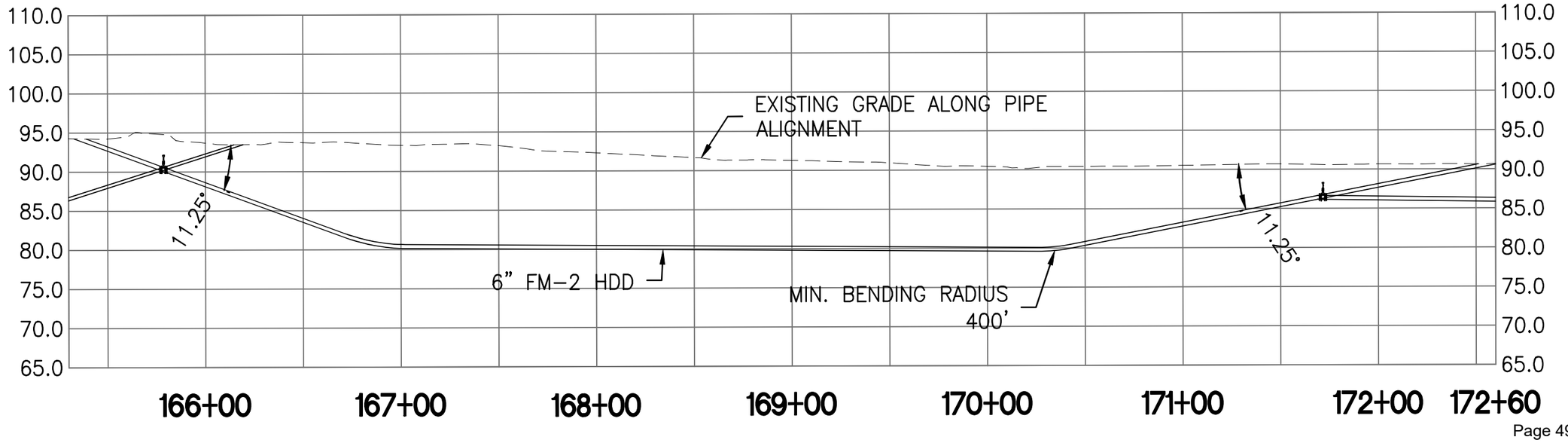


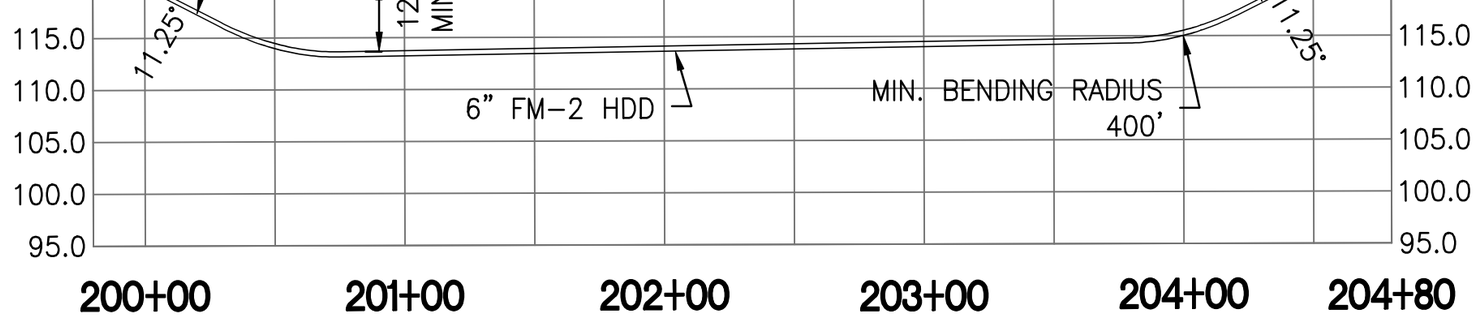
FM HDD PROFILE 1
C1





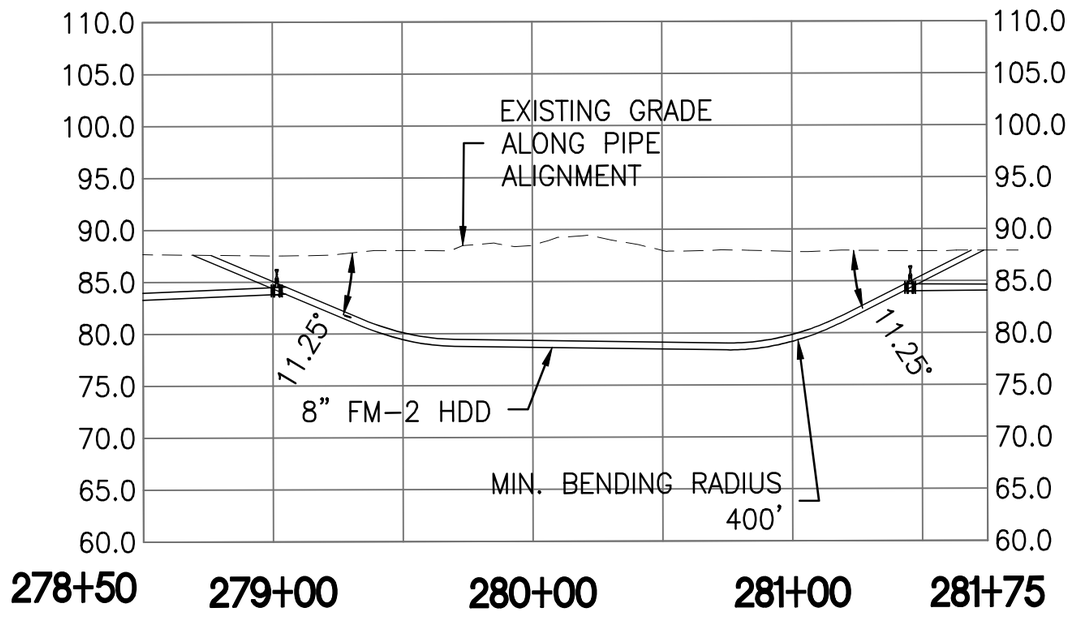
FM HDD PROFILE 3
C3





FM HDD PROFILE 5

C5



DENSITY ASTM D-1557 (98% WHEN UNDER PAVEMENT)

TE 3.

IPACTED BY HAND

LL LIFTS SHALL BE

MENT, AND SHALL BE
PERMIT ASSEMBLY

ENTS FOR COMPACTED
L IS REQUIRED.

WITH THE

RACT SPECIFICATIONS FOR
E APPLICABLE.

TIE. IF THE WIRE IS DAMAGED OR
E TRACING WIRE SHALL BE
EFT UNDER THE VALVE BOX COVER.

2, 4, AND 5 PROVIDED 1) THE LIFT
ND 2) FIELD TEST RESULTS

S	NOVEMBER 2021
42	G-3

WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

ALTERNATE OPTION 1 (SUFFICIENT COVER OR SEPARATION NOT AVAILABLE)

PROPOSED UTILITY	MINIMUM VERTICAL SEPARATION REQUIREMENTS						
	POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS	COMMENTS
POTABLE WATER	1'–0"	1'–0"(1,2)	1'–0"(1,2)	1'–0"(1)	1'–0"	1'–0"	SEE NOTE 1
GRAVITY SANITARY SEWER	1'–6"(2)	1'–0"	1'–0"	1'–6"	1'–6"(2)	1'–0"	
SEWAGE FORCE MAIN	1'–6"(2)	1'–0"	1'–0"	1'–0"	1'–6"(2)	1'–0"	SEE NOTE 2
STORM	1'–0"(1)	1'–6"	1'–0"	1'–0"	1'–0"	1'–0"	
RECLAIMED WATER	1'–0"	1'–6"	1'–6"	1'–0"	1'–0"	1'–0"	SEE NOTE 2
ELECTRIC TELECOMMUNICATIONS	1'–0"	1'–0"	1'–0"	1'–0"	1'–0"	1'–0"	

(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

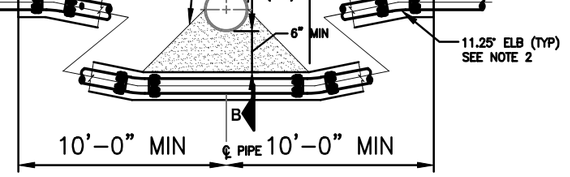
NOTES:
1. ONLY OPTION 1 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.
2. ONLY OPTION 2 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.

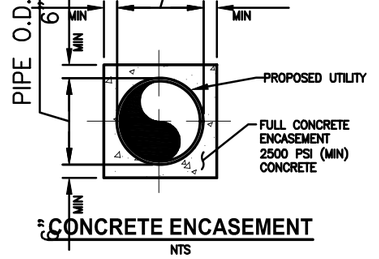
MINIMUM VERTICAL SEPARATION REQUIREMENTS

PROPOSED UTILITY	MINIMUM HORIZONTAL SEPARATION EXISTING UTILITY					
	POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS
POTABLE WATER	1'–0"	10'–0"(1,2)	10'–0"(1,2)	3'–0"(1)	3'–0"(1,3)	3'–0"
GRAVITY SANITARY SEWER	10'–0"(2)	1'–0"	1'–0"	3'–0"	3'–0"(2)	3'–0"
SEWAGE FORCE MAIN	10'–0"(2)	1'–0"	1'–0"	3'–0"	3'–0"(2)	3'–0"
STORM	3'–0"(1)	3'–0"	3'–0"	1'–0"	3'–0"	3'–0"
RECLAIMED WATER	3'–0"(1,3)	3'–0"(2)	3'–0"(2)	3'–0"	1'–0"	3'–0"
ELECTRIC TELECOMMUNICATIONS	3'–0"	3'–0"	3'–0"	3'–0"	3'–0"	2'–0"

(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

NOTE:
UTILITIES SHALL NOT BE INSTALLED WITHIN THE DRIP LINE OF TREES WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.





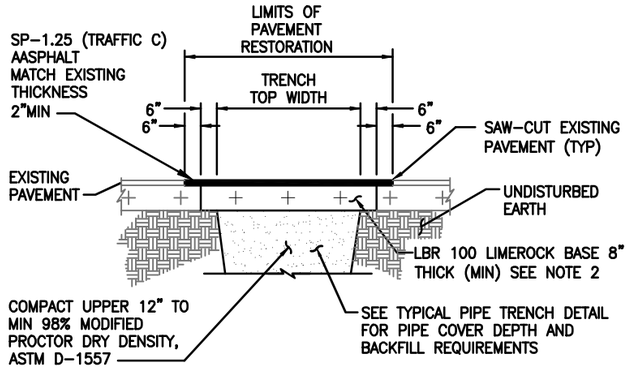
NOTES:
1. FOR PROPOSED WATER MAINS, THIS OPTION IS ONLY ALLOWED WITH APPROVAL OF THE ENGINEER AND FDEP ON A CASE BY CASE BASIS.
2. WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

ALTERNATE OPTION 2 (SUFFICIENT SEPARATION NOT AVAILABLE)

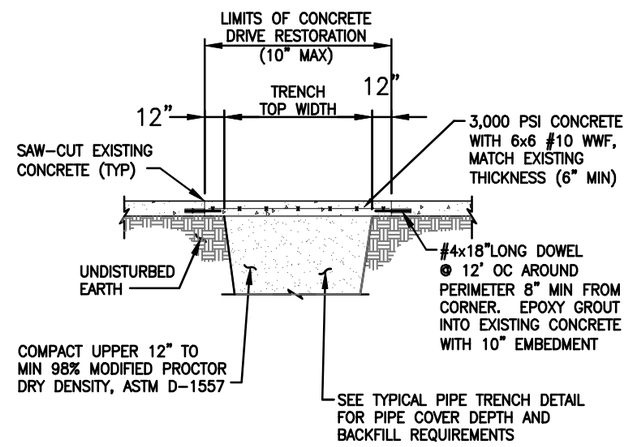
UTILITY CONFLICT

ZEPHYRHILLS UTILITIES DEPARTMENT WATER & WASTEWATER	**CITY OF ZEPHYRHILLS STANDARD DETAILS** CITY OF ZEPHYRHILLS UTILITY DEPARTMENT 39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542 PHONE (813)780-0029 FAX (813)780-0613	NOVEMBER 2021 **G-4**

NOTE:
THE INFORMATION SHOWN ABOVE IS PROVIDED BY THE CITY OF ZEPHYRHILLS. THIS DOES NOT REPRESENT THE WORK PRODUCT OF JONES EDMUNDS AND ASSOCIATES, INC. THEY ARE PROVIDED FOR REFERENCE ONLY AND TO ENSURE COMPLIANCE WITH THE CITY OF ZEPHYRHILLS STANDARDS. UNLESS MODIFIED BY THESE CONTRACT DOCUMENTS, THESE DETAILS WILL BE THE MINIMUM STANDARDS.



NOTES:
1. ASPHALT PAVEMENT RESTORATION DETAIL APPLIES TO CITY ROADS, DRIVEWAYS, PRIVATE ROADS, DRIVES, MISCELLANEOUS PATCHES, AND SIMILAR RESTORATION.
2. NEW LIMEROCK TO BE COMPACTED TO NOT LESS THAN 98%. MODIFIED PROCTOR DRY DENSITY, ASTMD–1557.
3. FOR COUNTY ROADS AND STATE ROADS, DESIGN SHALL BE IN COMPLIANCE WITH PASCO COUNTY STANDARDS AND FDOT STANDARDS RESPECTFULLY.



NOTES:
MATCH EXISTING GRADE AND FINISH.

CONCRETE DRIVE RESTORATION

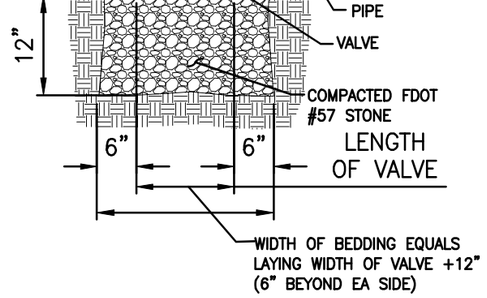
ROVIDE RESTRAINED

UMP (FDOT No

, VALVE,
TALLATION.

R SHALL BE
TO FIRE

S	NOVEMBER 2021
42	**W-10**



NOTES:

1. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.

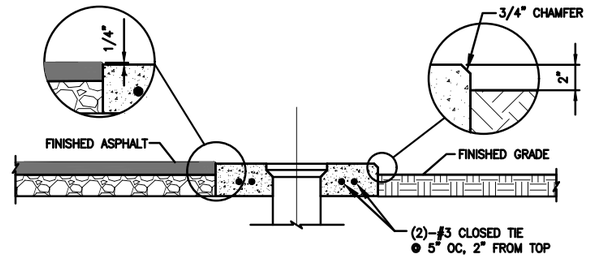
2. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.

GATE VALVE BOX

NTS

	CITY OF ZEPHYRHILLS STANDARD DETAILS CITY OF ZEPHYRHILLS UTILITY DEPARTMENT 39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542 PHONE (813)780-0029 FAX (813)780-0613	NOVEMBER 2021 **W-3**

PLAN VIEW



VALVE COLLAR AND IDENTIFICATION DISK

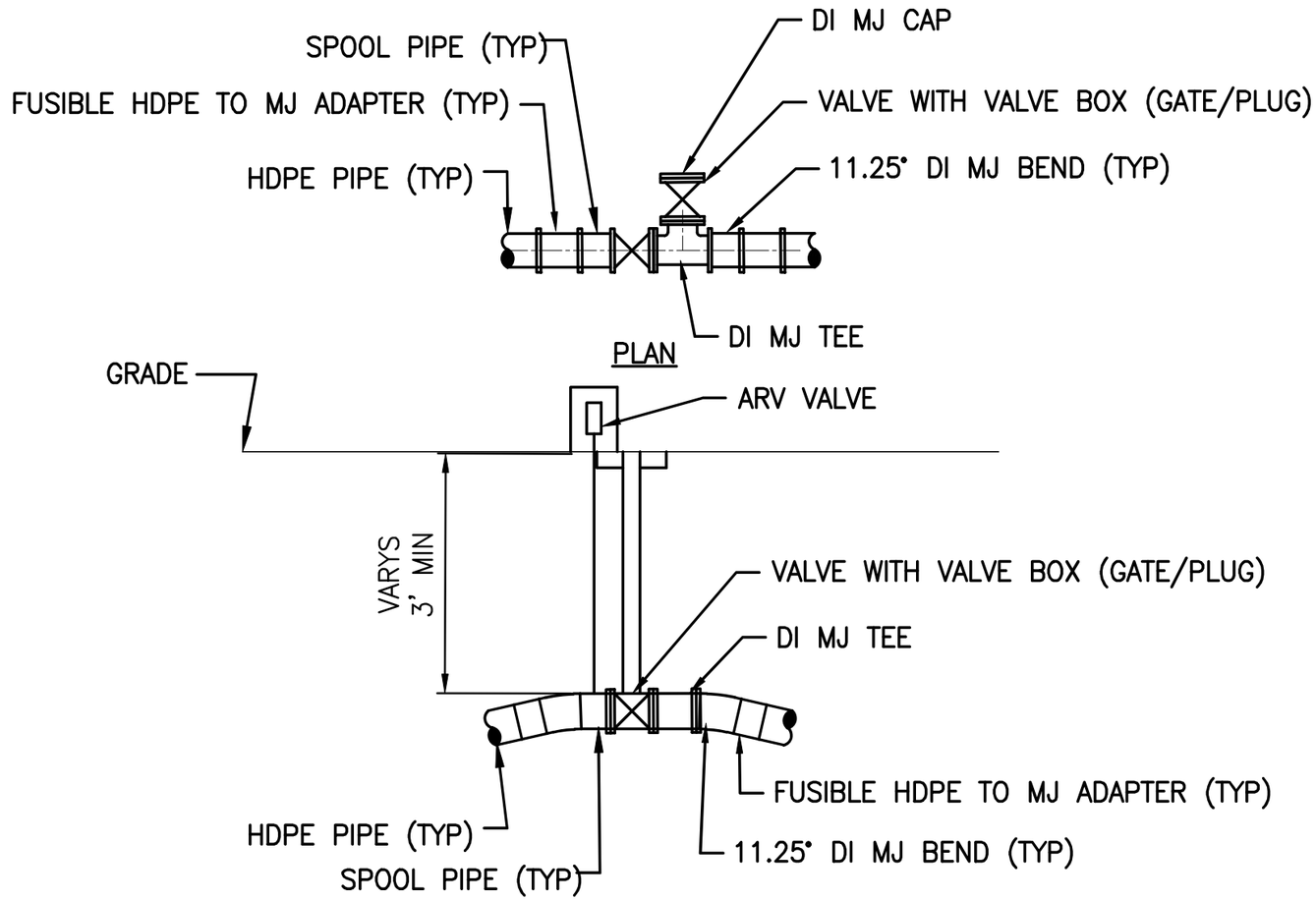
NTS

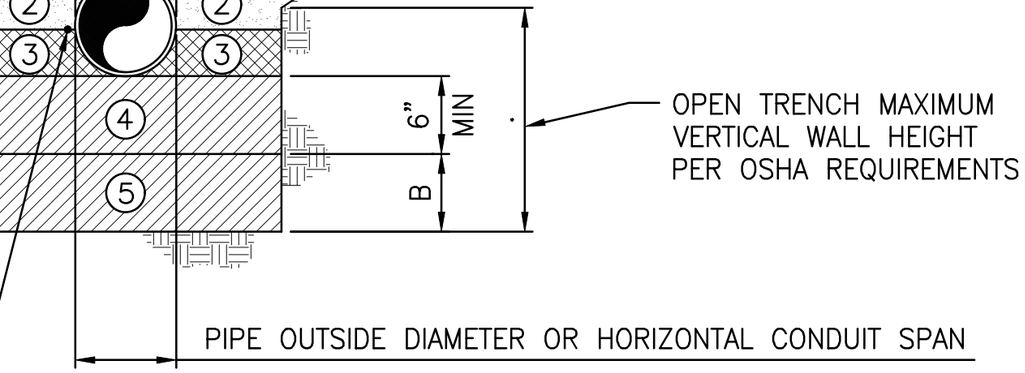
	CITY OF ZEPHYRHILLS STANDARD DETAILS CITY OF ZEPHYRHILLS UTILITY DEPARTMENT 39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542 PHONE (813)780-0029 FAX (813)780-0613	NOVEMBER 2021 **W-5**

NTER
CENT
AT AN

REETS

BLY





ZONE NO.	ZONE NAME	MATERIAL	ZONE 1 COMPACTION	ZONES 2–5 COMPACTION
①	FINAL BACKFILL	AS SPECIFIED	AT LEAST 98% MODIFIED PROCTOR MAXIMUM DRY DENSITY ASTM D–1557	AT LEAST 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY ASTM D–1557
②	INITIAL BACKFILL			
③	HAUNCHING			
④	BEDDING			
⑤	FOUNDATION			

EXCEEDING 6 INCHES, LOOSE MEASUREMENT. REFER TO ADDITIONAL NOTE 3.

EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HANICAL TAMPING. REFER TO ADDITIONAL NOTE 3.

TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS NG SHALL BE BROUGHT UP EQUALLY ON BOTH SIDES OF THE PIPE.

ATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT, AND AMPING. PROPERLY SHAPED BELL HOLES SHALL BE EXCAVATED IN THE BEDDING TO NAL NOTE 3.

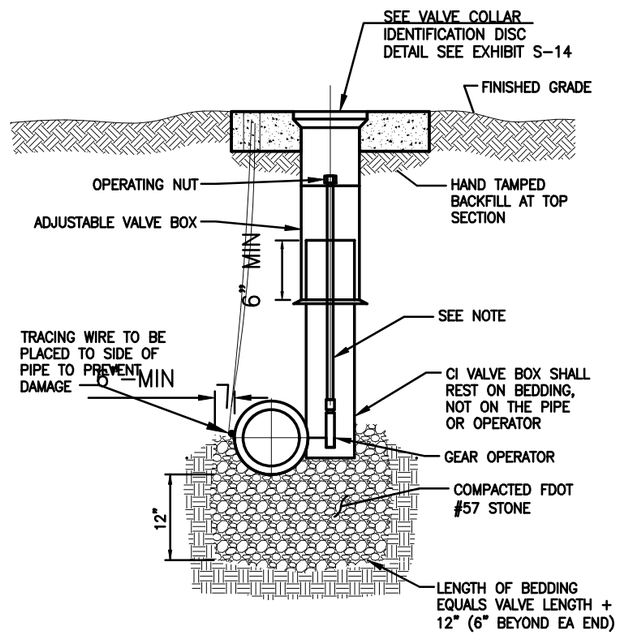
WATERED TRENCHES MEETING THE COMPACTION AND MATERIAL REQUIREMENTS FOR LACED OR REWORKED, EXCEPT FOR SHAPING OF THE BELL HOLES, AND WHERE

LE MATERIAL IS ENCOUNTERED. FOUNDATION SHALL BE IN ACCORDANCE WITH THE L NOTE 3.

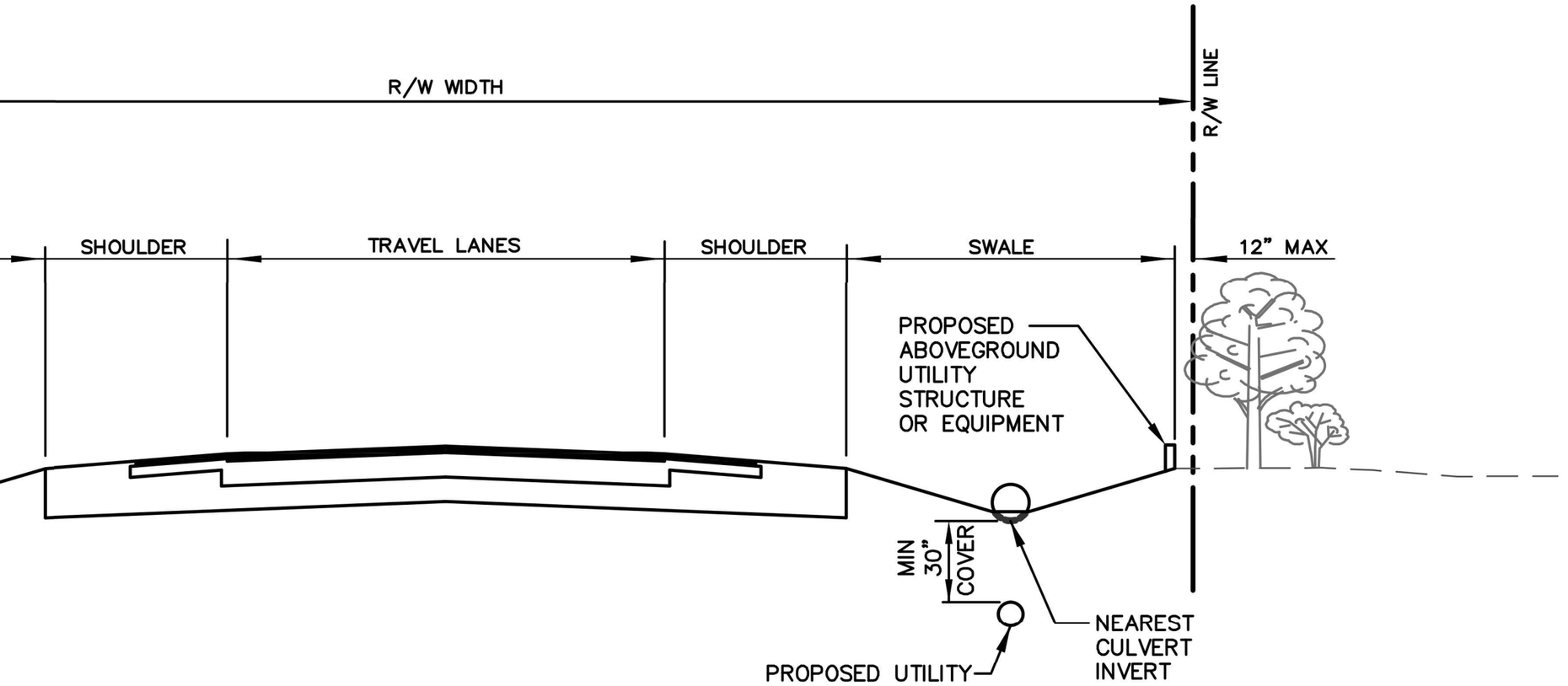
BENEATH SURFACE IMPROVEMENTS (EG, SLAB, ETC.) SEE CONTRACT SPECIFICATIONS FOR DRAWINGS FOR ASPHALT RESTORATION DETAILS.

OF THE PIPE AND ATTACHED TO THE PIPE EVERY 10' W/ A NYLON WIRE TIE. IF THE 3M WATERPROOF TYPE UF SPLICE SHALL BE INSTALLED TO REPAIR THE WIRE. THE ENDS

NOTE:
THE S–12 AND S–14 DETAILS ARE PR
REPRESENT THE WORK PRODUCT OF JO
FOR REFERENCE ONLY AND TO ENSURE
UNLESS MODIFIED BY THESE CONTRACT
STANDARDS.



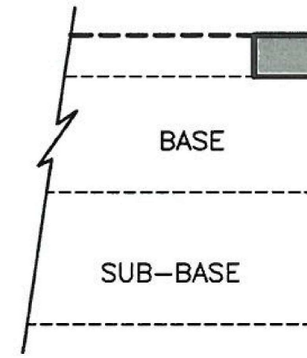
NOTES:
1. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.



TILITY INSTALLATION IN SWALE NEAR CULVERT

NTS

S APPROVED BY THE COUNTY ENGINEER.
D AND HIGHLIGHTED ON DETAIL.



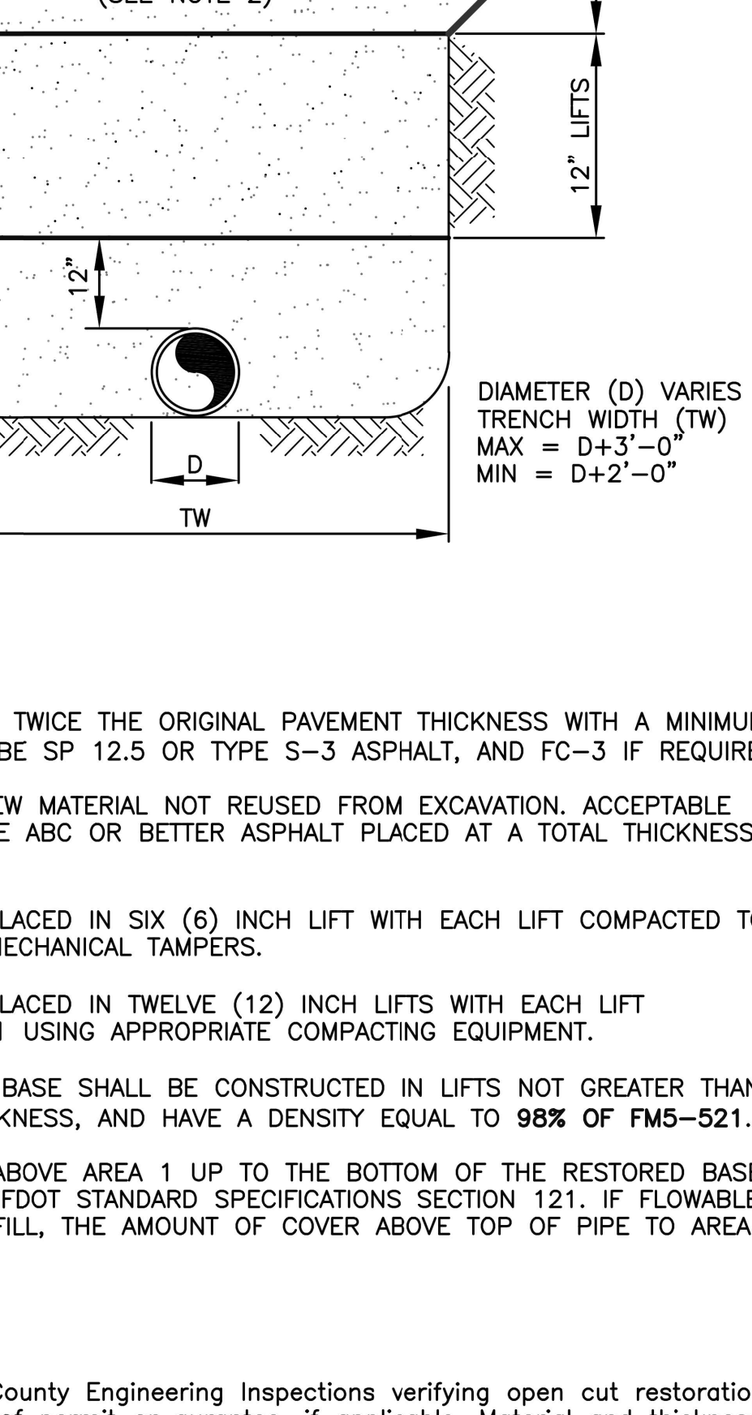
FLOWABLE FILL–CEMENT–
TYPE 1, 75–100 LBS/CY
28 DAY 100 PSI
(EXCAVATABLE)

COMPACTED SAND OR
SELECT MATERIAL

UNDISTURBED

NOTE:
NO DEVIATIONS TO THIS DETAIL WILL BE

C:\Standards\Conceptual\301_Utility-Install_Culvert.dwg



TWICE THE ORIGINAL PAVEMENT THICKNESS WITH A MINIMUM
BE SP 12.5 OR TYPE S-3 ASPHALT, AND FC-3 IF REQUIRED.

EW MATERIAL NOT REUSED FROM EXCAVATION. ACCEPTABLE
E ABC OR BETTER ASPHALT PLACED AT A TOTAL THICKNESS

LACED IN SIX (6) INCH LIFT WITH EACH LIFT COMPACTED TO
ECHANICAL TAMPERS.

LACED IN TWELVE (12) INCH LIFTS WITH EACH LIFT
USING APPROPRIATE COMPACTING EQUIPMENT.

BASE SHALL BE CONSTRUCTED IN LIFTS NOT GREATER THAN
KNESS, AND HAVE A DENSITY EQUAL TO **98% OF FM5-521**.

ABOVE AREA 1 UP TO THE BOTTOM OF THE RESTORED BASE.
FDOT STANDARD SPECIFICATIONS SECTION 121. IF FLOWABLE
FILL, THE AMOUNT OF COVER ABOVE TOP OF PIPE TO AREA 2

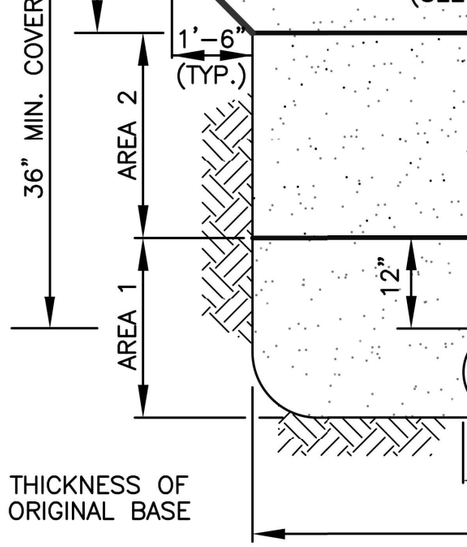
County Engineering Inspections verifying open cut restoration
of permit or gurantee, if applicable. Material and thickness
ting shall be Pasco County Services Department Testing
oads, Storm Drainage and Utilities; October 2006.

UNLESS APPROVED BY THE COUNTY ENGINEER.
ENTIFIED AND HIGHLIGHTED ON DETAIL.

OPEN CUT RESTORATION

Sheet No.
1 of 1

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NOTES

1. REPLACEMENT ASPHALT SHALL BE TWICE THE
   OF TWO (2) INCHES AND SHALL BE SP 12.5
2. REPLACEMENT BASE SHALL BE NEW MATERIAL
   BASE ALTERNATIVE SHALL BE TYPE ABC OR B
   OF SIX (6) INCHES.
3. AREA 1 – BACKFILL SHALL BE PLACED IN SIX
   98% OF ASTM FM5-521 USING MECHANICAL T
4. AREA 2 – BACKFILL SHALL BE PLACED IN TW
   COMPACTED TO **98% OF FM5-521** USING APP
5. AREA 3 – LIMEROCK (LBR 100) BASE SHALL
   SIX (6) INCHES COMPACTED THICKNESS, AND
6. FLOWABLE FILL MAY BE PLACED ABOVE AREA
   MIX DESIGN SHALL CONFORM TO FDOT STANDA
   FILL IS USED FOR TRENCH BACKFILL, THE AM
   MAY BE REDUCED TO 6 INCHES.

Tests shall be submitted to Pasco County Engine
is per general notes before release of permit or
verification shall be required. All testing shall be
Specificatiions for Construction of Roads, Storm

NOTE:
NO DEVIATIONS TO THIS DETAIL WILL BE PERMITTED UNLESS API
ANY PROPOSED ALTERATIONS SHALL BE CLEARLY IDENTIFIED AND

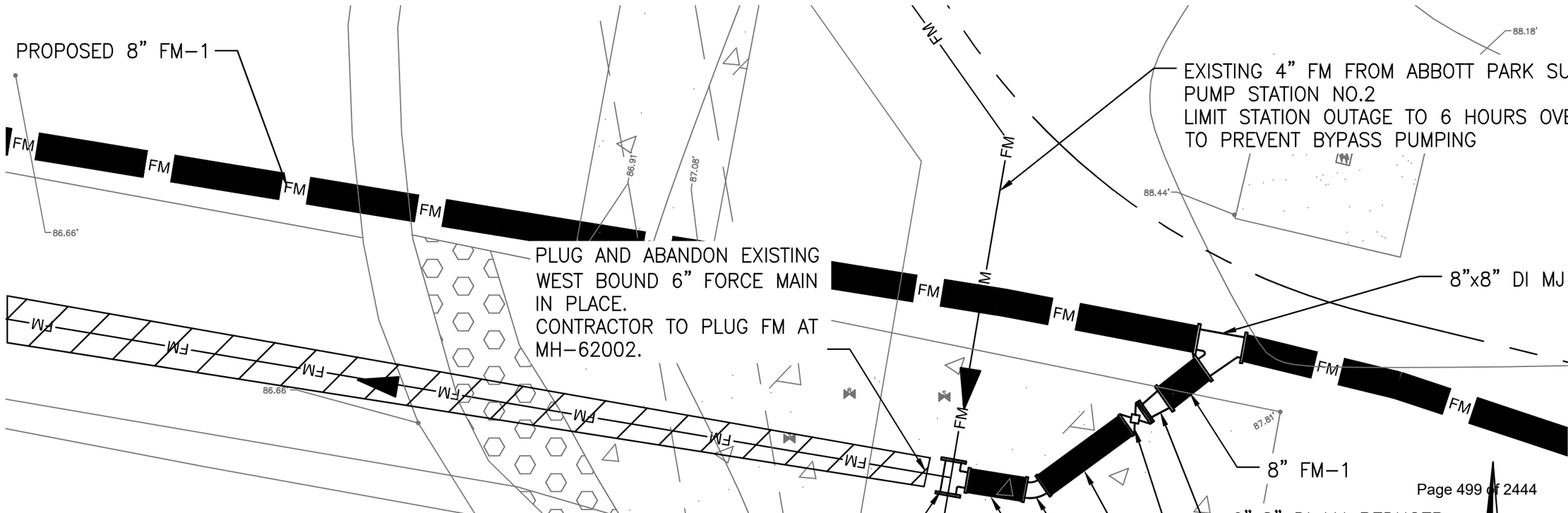
PASCO COUNTY
ENGINEERING SERVICES

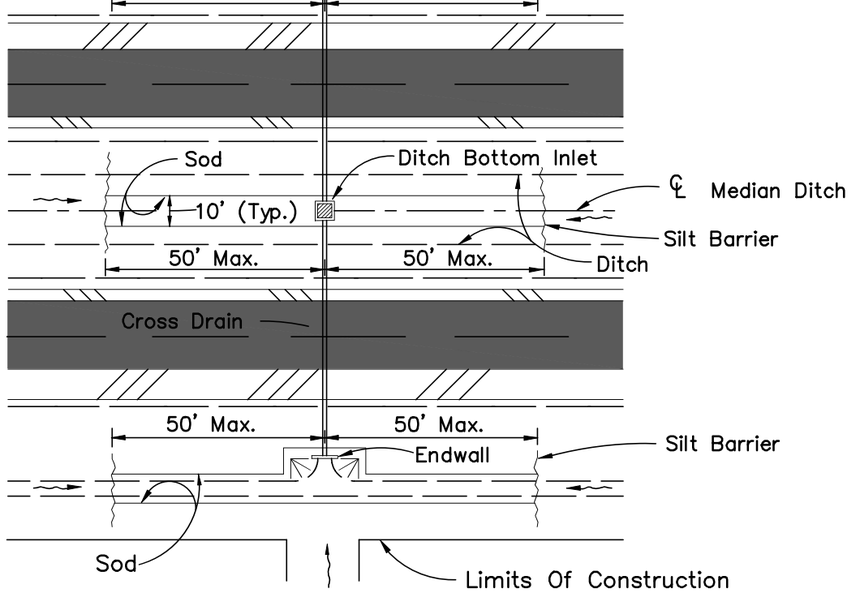
FINISHED

EX
TO
TO

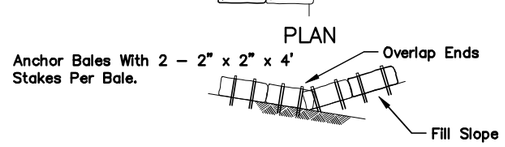
NOTE
SIDE

CO



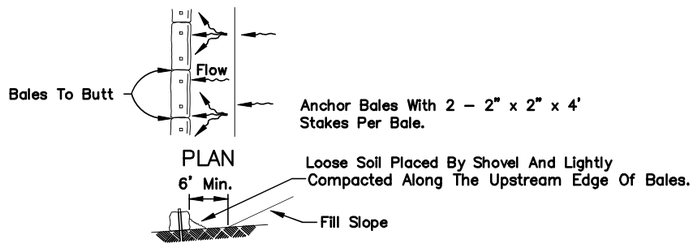


DITCH INSTALLATIONS AT DRAINAGE STRUCTURES



ELEVATION

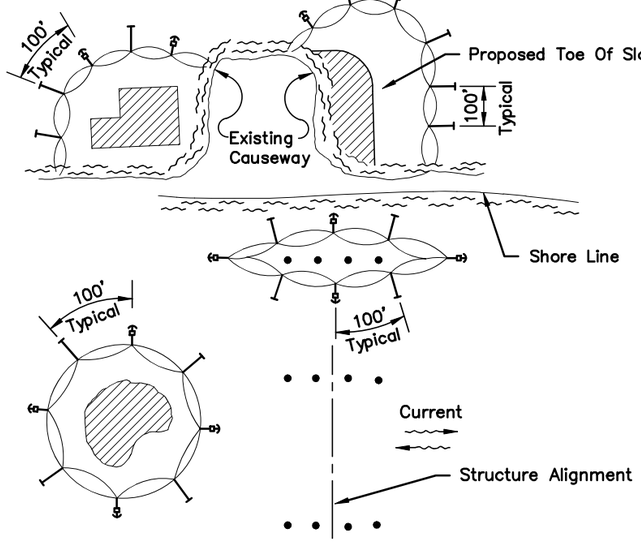
TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES TOWARD THE TOE OF SLOPE



ELEVATION

TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TOE OF SLOPE

BARRIERS FOR FILL SLOPES



NOTES:

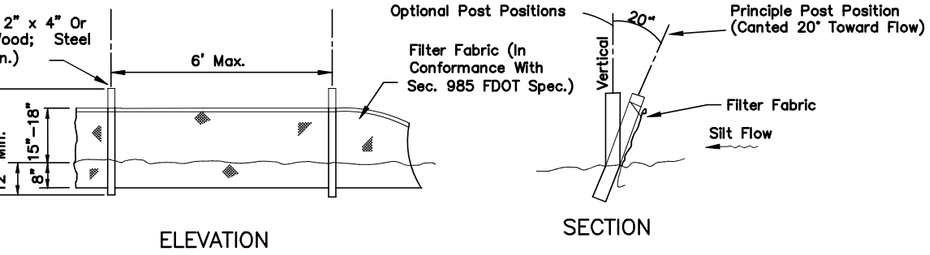
1. Turbidity barriers are to be used in all permanent bodies of
2. Number and spacing of anchors dependent on current velocit
3. Deployment of barrier around pile locations may vary to acc
4. Navigation may require segmenting barrier during construction
5. For additional information see Section 104 of the FDOT Stand

TURBIDITY BARRIER APPLI

TUR

HAY BALE LOCATION

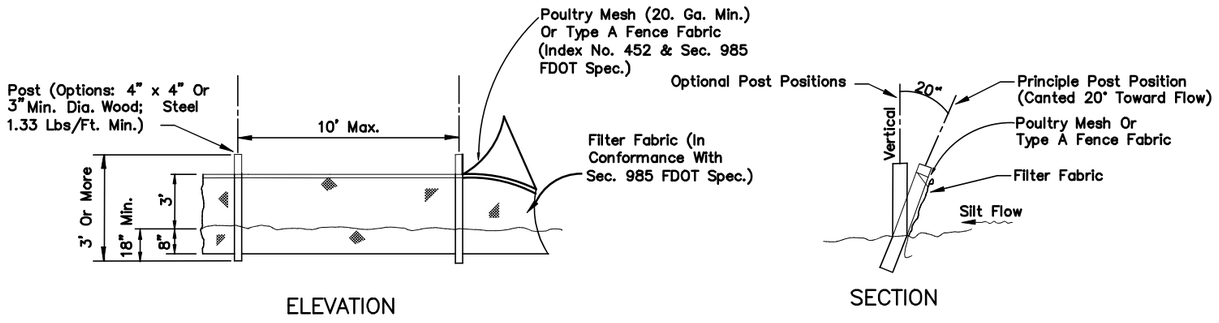
(D–901)
N.T.S.



ELEVATION

SECTION

TYPE III SILT FENCE

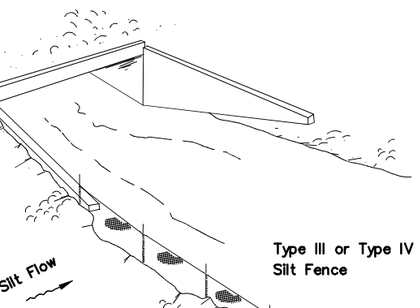


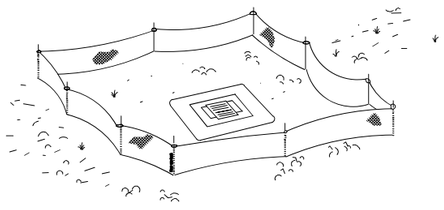
ELEVATION

SECTION

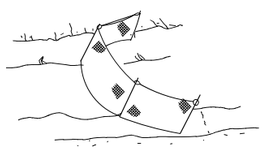
Note: Silt Fence to be paid for under the contract lump sum price for Erosion and Sediment Control.

TYPE IV SILT FENCE

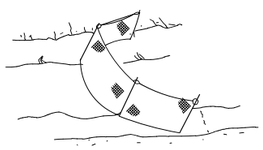


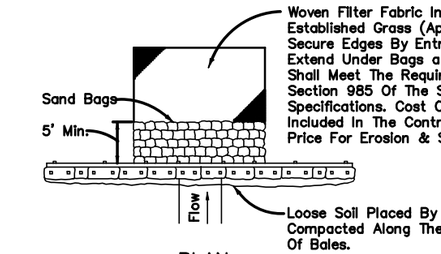


Type III Or Type IV Silt Fence Protection Around Ditch Bottom Inlets

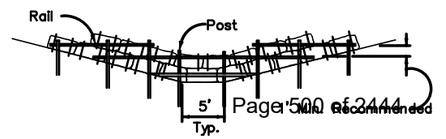


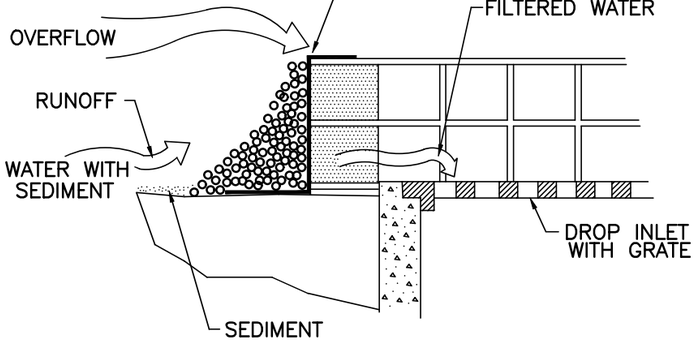
Type IV Silt Fence





PLAN





SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.

BLOCK & GRAVEL DROP INLET SEDIMENT FILTER

(D–904)
N.T.S.

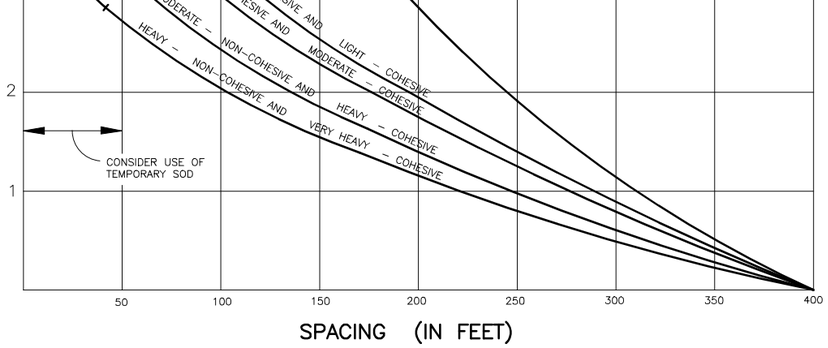
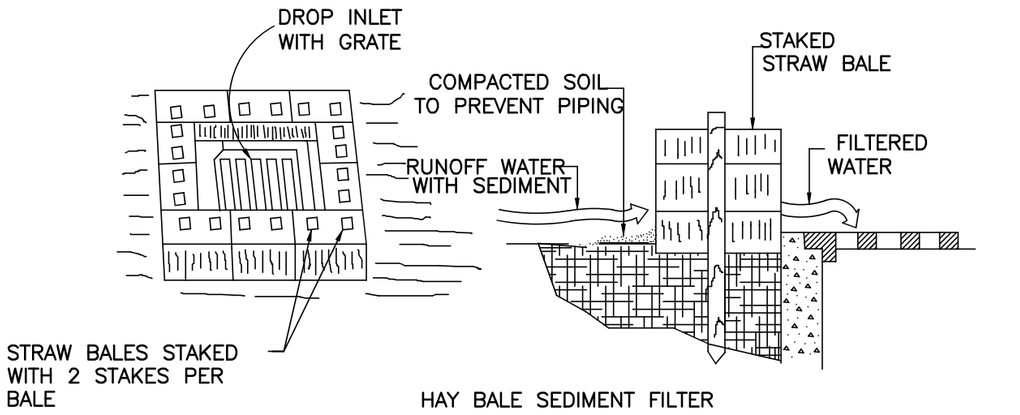


CHART I

RECOMMENDED SPACING FOR TYPE I AND TYPE II HAY BALE BARRIERS, AND TYPE III AND TYPE IV SILT FENCES AND PAVED DITCH HAY BALE BARRIERS

SPACING RECOMMENDATION FOR SILT FENCES & HAY BALES

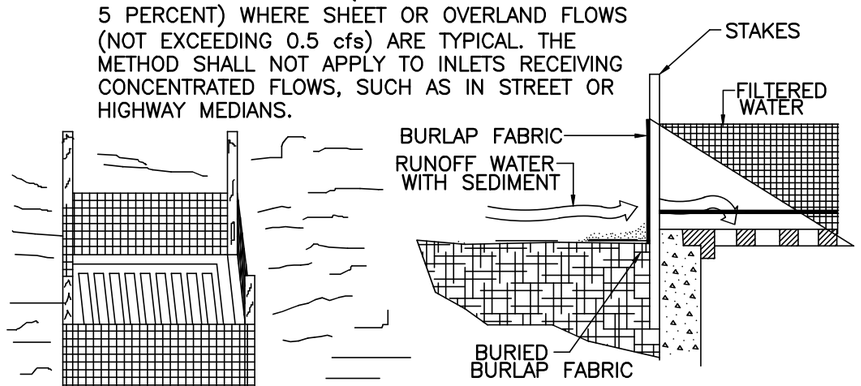
(D–906)
N.T.S.

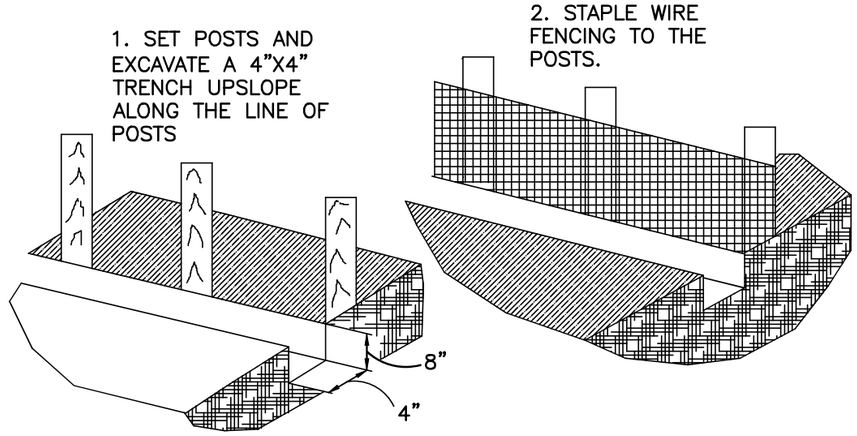


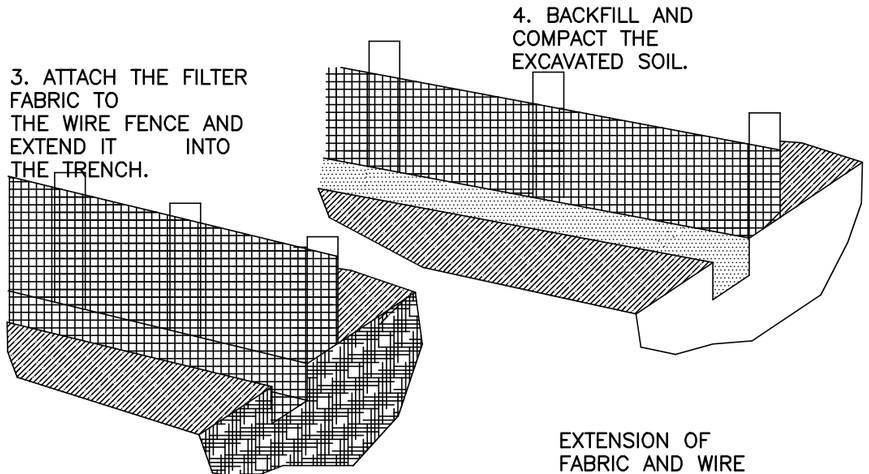
HAY BALE SEDIMENT FILTER

SPECIFIC APPLICATION

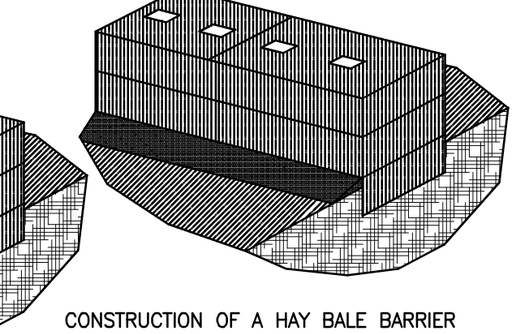
THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 cfs) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.



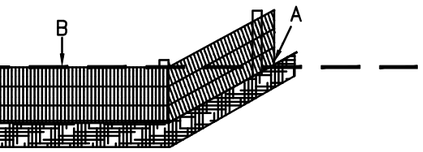




EXTENSION OF FABRIC AND WIRE



CONSTRUCTION OF A HAY BALE BARRIER



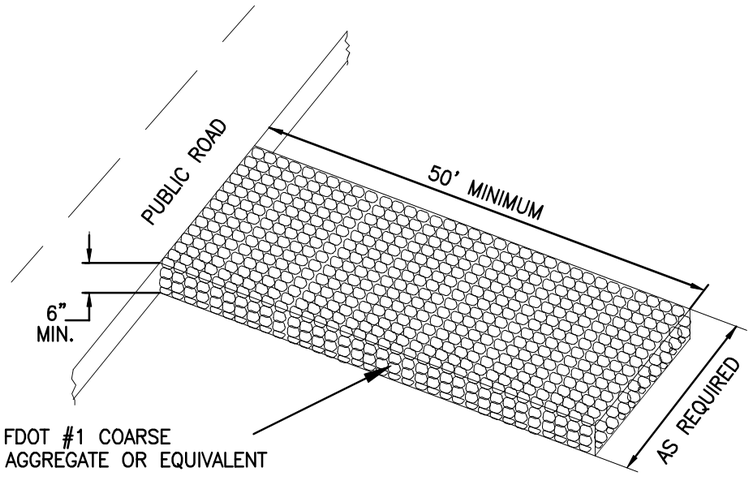
D BE HIGHER THAN POINT B

HAY BALE BARRIER IN DRAINAGE WAY

NOTE: THIS REPRESENT THE OPTIMUM LOCATION OF THE TEMPORARY SEDIMENT BASIN. OTHER ON–SITE LOCATIONS MAY ALSO BE APPROPRIATE.

IER CONSTRUCTION DETAILS

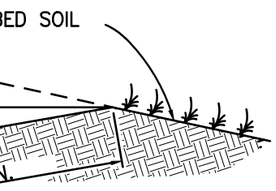
(D–913)
N.T.S.



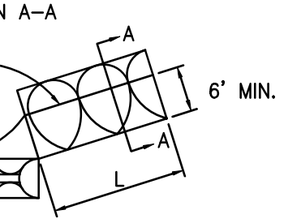
STABILIZED CONSTRUCTION ENTRANCE

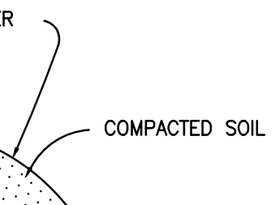
N.T.S.

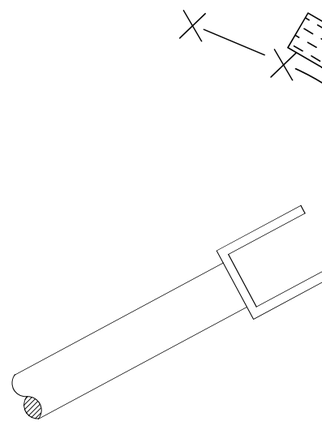
TEMPORAR



N A–A







NOTES:

1. Cover or deactivate pedestrian traffic signal display(s) controlling closed crosswalks.

2. Place pedestrian LCDs across the full width of the closed sidewalk.

3. For post mounted signs located near or adjacent to a sidewalk, maintain a minimum 7' clearance from the bottom of the sign panel to the surface of the sidewalk.

4. "Sidewalk Closed" signs (R9-XX) may be mounted on pedestrian LCDs in accordance with the manufacturer's instructions.

5. Omit the Advance Closure LCD if it blocks access to other pedestrian facilities (e,g,, transit stops, residences, or business entrances).

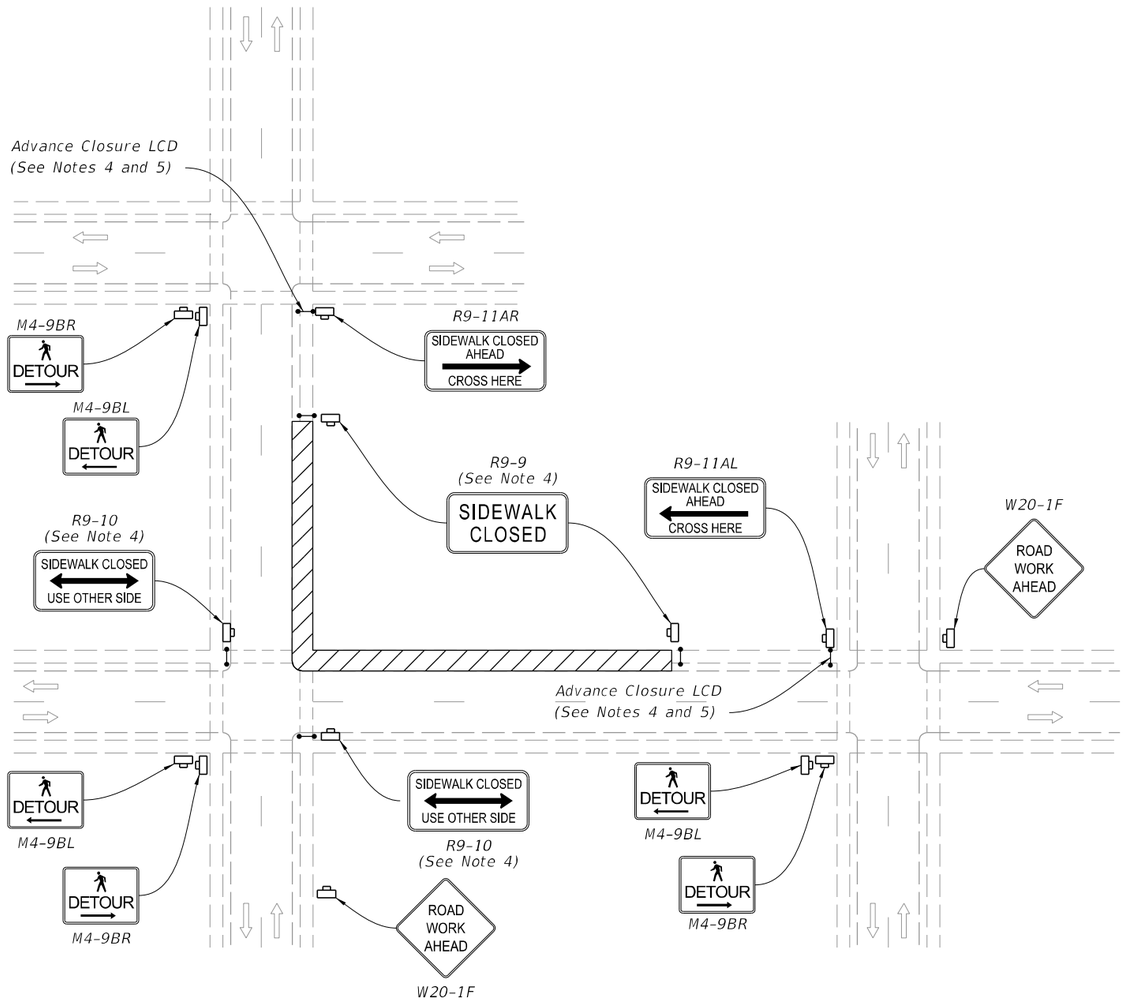
SYMBOLS:

Work Area

Work Zone Sign

Pedestrian Longitudinal Channelizing Device (LCD)

Lane Identification and Direction of Traffic



PEDESTRIAN DETOUR

9/21/2021 12:26:54 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2022-23 STANDARD PLANS	SIDEWALK CLOSURE	INDEX	SHEET
11/01/20					102-660	1 of 2

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

NOTES:

1. L = Taper Length
   B = Buffer Length
   X = Work Zone Sign Distance
   See Index 102-600 for "L", "B", "X", channelizing device spacing values.

2. Provide a 5' wide temporary pedestrian way with a maximum cross-slope of 0.02, except where space restrictions warrant a minimum width of 4'. Provide a 5' x 5' passing space for temporary pedestrian ways less than 5' in width at intervals not to exceed 200'.

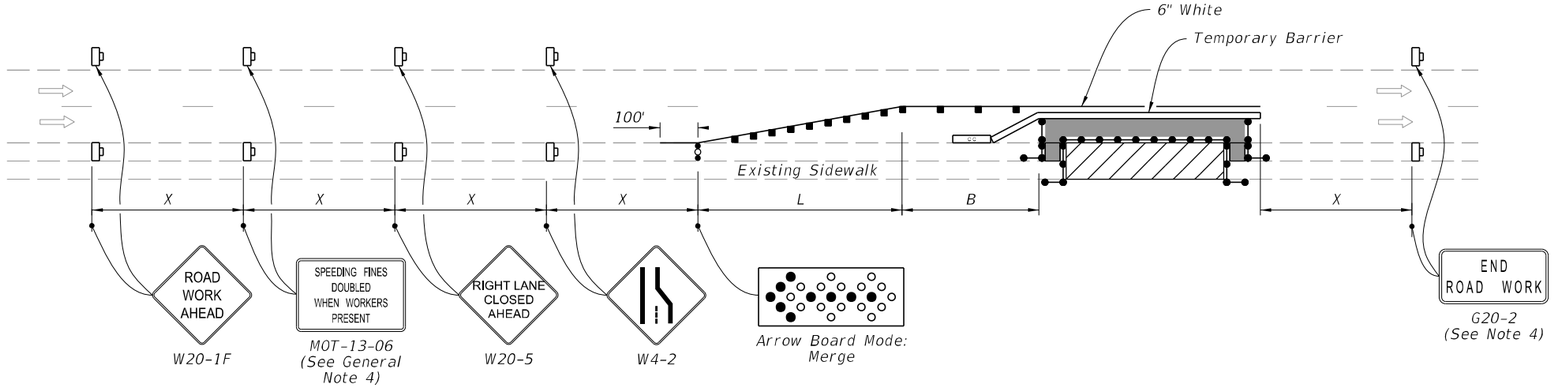
3. When temporary pedestrian ways require curb ramps, meet the requirements of Index 522-002. Detectable warnings are not required for curb ramps diverting pedestrian traffic into a closed lane.

4. The "Speeding Fines Doubled When Workers Present" signs (M0T-13-06) and "End Road Work" signs (G20-2), along with associated work zone sign distances, may be omitted when the work operation will be in place for 24 hours or less.

5. Pedestrian Diversion Option 2 may only be used when called for in the Plans or as approved by an Engineer.

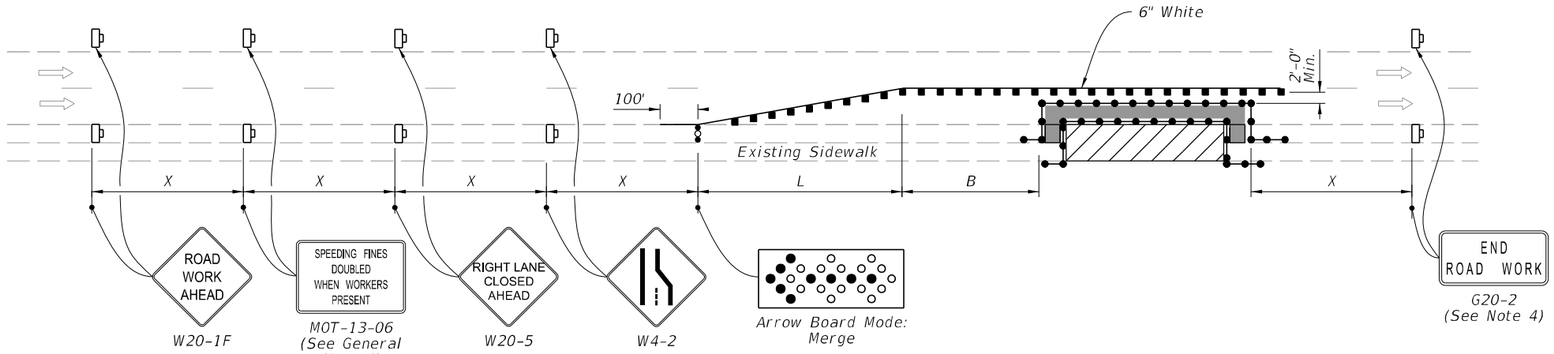
SYMBOLS:

- Work Area
- Temporary Pedestrian Way
- Channelizing Device (See Index 102-600)
- Pedestrian Longitudinal Channelizing Device (LCD)
- Work Zone Sign
- Arrow Board
- CC Crash Cushion
- Lane Identification and Direction of Traffic



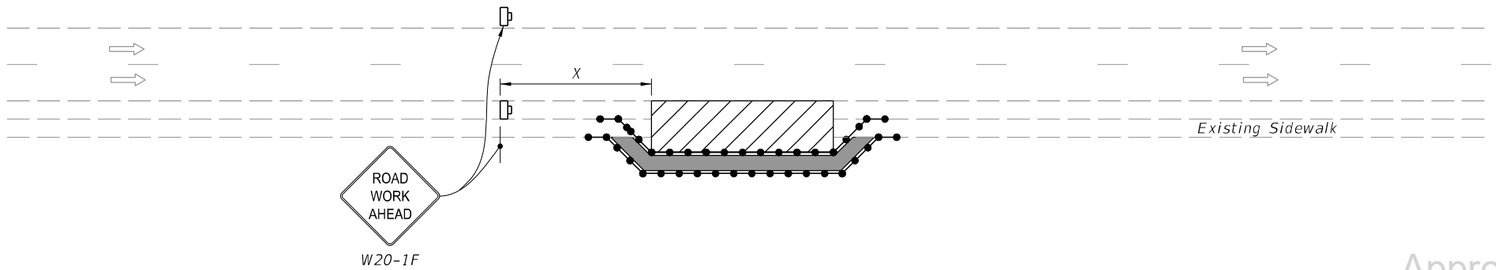
PEDESTRIAN DIVERSION - OPTION 1

(Temporary Barrier Shown, Low Profile Barrier Similar)



PEDESTRIAN DIVERSION - OPTION 2

(Work Zone Speed 35 mph or Less)



PEDESTRIAN SPECIAL DETOUR

9/21/2021 12:26:55 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	SIDEWALK CLOSURE	INDEX	SHEET
11/01/21						102-660	2 of 2

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

Florida Department of Transportation

Stormwater Pollution Prevention



Background

The National Pollutant Discharge Elimination System (NPDES) is a stormwater permitting program managed by the Florida Department of Environmental Protection (FDEP) which regulates construction activities that disturb one or more acres of land. Projects less than one acre may by regulated if the activity is part of a larger common plan of development or sale that will exceed the one acre threshold. Disturbance includes clearing, grading, and excavating.

The NPDES program also regulates municipal storm sewer systems that serve highways, area roads, and streets in your neighborhood.

Construction Requirements for Regulated Activities

- Prepare and implement a Stormwater Pollution Prevention Plan (SWPPP)
- Obtain and abide by Department of Environmental Protection (DEP) Generic Permit for Construction Activities.

For more information regarding NPDES Generic Permits for Construction Activities, please visit:
http://www.dep.state.fl.us/water/stormwater/npdes/construction1.htm

To apply using the online FDEP Business Portal, please visit:
http://www.fldepportal.com/go/apply-build/

Contacts

To report **illicit discharges**, please contact the appropriate representative listed below:

Citrus County	Citrus County BOCC – Engineering	Primary: 352-527-5446
Hernando County	Hernando County Stormwater	Primary: 352-754-4062
Hillsborough County	Hillsborough County Environmental Protection Commission	Primary: 813-627-2600 Alternate: 813-744-5671
Pasco County	Pasco County Stormwater	Primary: 727-834-3611
Pinellas County	Pinellas County Environmental Management	Primary: 727-464-4187 Alternate: 727-464-4703
FDOT Right-of-Way	District Maintenance	Primary: 813-975-6639

Environmental Protection Agency (EPA) **Spill Response Hotline: 1-800-424-8802**
For EPA spill and environmental violation information, please visit:
https://www.epa.gov/pesticide-incidents/report-spills-and-environmental-violations

Preventing Illicit Discharges & Water Pollution

Illicit Discharges are point sources of discharge which negatively impact stormwater, which eventually drains into local natural water systems. The most effective way to eliminate these discharges is to dispose of pollutants correctly. Below are common examples:

- Yard clippings & leaves
- Fertilizers and herbicides
- Pet waste
- Trash
- Used motor oil / filters
- Antifreeze/transmission fluid
- Paint
- Solvent / degreaser
- Cooking Grease





For more information on the proper disposal of wastes contact FDEP at 813-470-5700

Approved
2023H-23-00203
James A. Meyer
10/30/2023

FDEP (Water) Permit

FLORIDA DEPARTMENT OF
Environmental Protection

Southwest District Office
13051 North Telecom Parkway #101
Temple Terrace, Florida 33637-0926

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

Notification of Acceptance of Use of a General Permit

PERMITTEE:
John Bostic, Utilities Director
City of Zephyrhills
5335 8th Street
Zephyrhills, Florida 33542
jbostic@ci.zephyrhills.fl.us

Permit Number: 0082640-167-DSGP/02
Issue Date: October 16, 2023
Expiration Date: October 15, 2028
County: Pasco
Project Name: North Side LS Phase 3
Water Supplier: City of Zephyrhills
PWS ID: 651-2020

Dear Mr. Bostic:

On October 3, 2023, the Florida Department of Environmental Protection received a "*Notice of Intent to Use the General Permit for Construction of Water Main Extensions for PWSs*" [DEP Form No. 62-555.900(7)], under the provisions of Rule 62-4.530 and Chapter 62-555, Florida Administrative Code (F.A.C.). The proposed project includes the construction of approximately 4,000 linear feet of 12-inch diameter water main pipe(s). The project is located on Kossik Road between Fort King Road and Green Slope Drive.

Based upon the submitted Notice and accompanying documentation, this correspondence is being sent to advise that the Department does not object to the use of such general permit at this time. Please be advised that the permittee is required to abide by Rule 62-555.405, F.A.C., all applicable rules in Chapters 62-4, 62-550, 62-555, F.A.C., and the General Conditions for All General Drinking Water Permits (found in 62-4.540, F.A.C.).

All construction must be in accordance with this permit. Before commencing work on project changes for which a construction permit modification is required per 62-555.536(1), the permittee shall submit to the Department a written request for a permit modification. Each such request shall be accompanied by one copy of a revised construction permit application, the proper processing fee and one copy of either a revised preliminary design report or revised drawings, specifications and design data.

The permittee shall comply with all sampling requirements specific to this project. These requirements are attached for review and implementation.

Pursuant to Rule 62-555.345, F.A.C., the permittee shall submit a certification of construction completion [DEP Form No. 62-555.900(9)] to the Department and obtain approval, or clearance, from the Department before placing any water main extension constructed under this general permit into operation for any purpose other than disinfection or testing for leaks.

Within 30 days after the sale or legal transfer of ownership of the permitted project that has not been cleared for service in total by the Department, both the permittee and the proposed permittee shall sign and submit an application for transfer of the permit using Form 62-555.900(8), F.A.C., with the appropriate fee. The permitted construction is not authorized past the 30-day period unless the permit has been transferred.

This permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project, per Rule 62-4.030, F.A.C.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

for Shannon Herbon
Program Administrator
Permitting & Waste Cleanup Program
Southwest District

Enclosures: Clearance Requirements/Utilities Separation Requirements

cc:
Kenneth A. Fraser, P.E., Jones Edmunds, kfraser@jonesedmunds.com
Belinda Oliver, DEP SWD, Belinda.Oliver@floridadep.gov

A Civil Penalty May Be Incurred

if this project is placed into operation before obtaining a clearance from this office.

Requirements for clearance upon completion of projects are as follows:

1) **Clearance Form**
Submission of a fully completed Department of Environmental Protection (DEP) Form 62-555.900(9) *Certification of Construction Completion and Request for Clearance to Place Permitted PWS Components into Operation*.

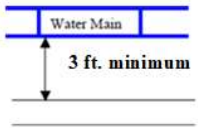
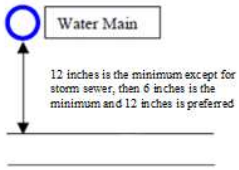
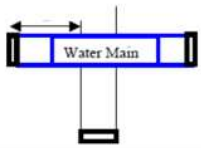
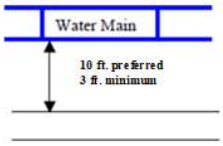
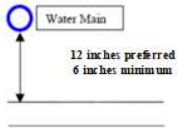
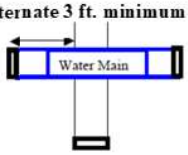
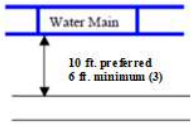
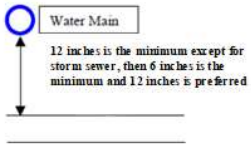
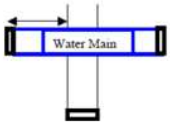
2) **Record Drawings, if deviations were made**
Submission of the portion of record drawings showing deviations from the DEP construction permit, including preliminary design report or drawings and specifications, if there are any deviations from said permit (Note that it is necessary to submit a copy of only the portion of record drawings showing deviations and not a complete set of record drawings.).

3) **Bacteriological Results**
Copies of satisfactory bacteriological analysis (a.k.a. Main Clearance), taken within sixty (60) days of completion of construction, from locations within the distribution system or water main extension to be cleared, in accordance with Rules 62-555.315(6), 62-555.320(12)(d), 62-555.350(6), 62-555.340, and 62-555.330, F.A.C. and American Water Works Association (AWWA) Standard C 651-92, as follows:

- Connection to existing system
- The end point of the proposed addition
- Any water lines branching off a main extension
- Every 1,200 feet on straight runs of pipe

Each location shall be sampled on two consecutive days, at least 6 hours apart, with sample points and chlorine residual readings clearly indicated on the report. A sketch or description of all bacteriological sampling locations must also be provided.

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH RULE 62-555.314, F.A.C.

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)			Alternate 3 ft. minimum 
Vacuum Sanitary Sewer			Alternate 3 ft. minimum 
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)			Alternate 6 ft. minimum 
On-Site Sewage Treatment & Disposal System	10 ft. minimum	---	---

(1) Water main should cross over other pipe. When water main must be below other pipe, the minimum separation is 12 inches.

(2) Reclaimed water regulated under Part III of Chapter 62-610, F.A.C.

(3) 3 ft. for gravity sanitary sewer where the bottom of the water main is laid at least 6 inches above the top of the gravity sanitary sewer.

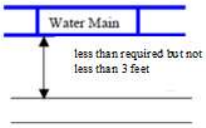
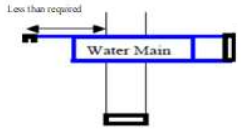
(4) Reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

EXCEPTIONS TO MINIMUM SEPARATION REQUIREMENTS

Where it is not technically feasible or economically sensible to comply with the requirements of 62-555.314(1) or (2), F.A.C., **the Department shall allow exceptions to these requirements if suppliers of water or construction permit applicants provide technical or economic justification for each exception and provide alternative construction features that afford a similar level of reliability and public health protection.**

Acceptable alternative construction features include the following:

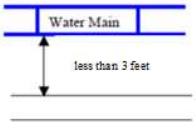
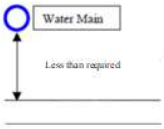
LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(a), F.A.C.

Other Pipe	Horizontal Separation	Joint Spacing @Crossings (Full Joint Centered)
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

Where an underground water main is being laid **less than the required minimum horizontal distance** from another pipeline and where an underground water main is **crossing another pipeline and joints in the water main are being located less than the required minimum distance from joints in the other pipeline**:

1. Use of pressure-rated pipe conforming to the American Water Works Association standards incorporated into Rule 62- 555.330, F.A.C., for the other pipeline if it is a gravity- or vacuum-type pipeline;
2. Use of welded, fused, or otherwise restrained joints for either the water main or the other pipeline; **or**
3. Use of watertight casing pipe or concrete encasement at least four inches thick for either the water main or the other pipeline.

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(b), F.A.C.

Other Pipe	Horizontal Separation	Crossings
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

Where an underground water main is being laid **less than three feet horizontally** from another pipeline and where an underground water main is **crossing another pipeline and is being laid less than the required minimum vertical distance from the other pipeline**:
Use of pipe, or casing pipe, having high impact strength (i.e., having an impact strength at least equal to that of 0.25-inch-thick ductile iron pipe) or concrete encasement at least four inches thick for both the water main **and** for the other pipeline if it is new and is conveying wastewater or reclaimed water.

Disclaimer – This document is provided for your convenience only. Please refer to Rule 62-555.314, F.A.C., for additional construction requirements.

FDEP (Wastewater) Permit

FLORIDA DEPARTMENT OF Environmental Protection

Southwest District Office
13051 North Telecom Parkway #101
Temple Terrace, Florida 33637-0926

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

October 30, 2023

PERMITTEE:
John Bostic III, Utilities Director
City of Zephyrhills
5335 8th Street
Zephyrhills, FL 33542
JBostic@ci.zephyrhills.fl.us

PERMIT NUMBER:	CS51-0030492-127-DWC/CG
ISSUE DATE:	October 30, 2023
EXPIRATION DATE:	October 29, 2028
COUNTY:	Pasco
PROJECT NAME:	North Side LS Phase 3
WWTF NAME:	City of Zephyrhills WWTF
FACILITY ID:	FLA012744

NOTIFICATION OF ACCEPTANCE OF USE OF A GENERAL PERMIT

Dear Mr. Bostic,

This letter acknowledges receipt of your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System for the subject project. Our Office received the Notice on October 5, 2023.

This is to advise you that the Department does not object to your use of this general permit for the following: Approximately 12,400 linear feet of six-inch diameter force main pipe(s) and 5,070 linear feet of eight-inch diameter force main pipe(s).

Please note the attached requirements apply to your use of this general permit for constructing the proposed domestic wastewater collection/transmission system.

You are further advised that the construction activity must conform to the description contained in your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System and that any deviation may subject the permittee to enforcement action and possible penalties.

If you have any questions, please contact Christine Smykowski at 813-470-5777 or via email at Christine.Smykowski@FloridaDEP.gov.

Sincerely,

for Shannon Herbon
Program Administrator
Permitting & Waste Cleanup Program
Southwest District

Copies furnished to:
Kenneth A. Fraser, P.E., Jones Edmunds & Associates, Inc., kfraser@jonesedmunds.com
Michael L. Clark, P.E., Jones Edmunds & Associates, Inc., mclark@jonesedmunds.com
Keyla Virgilio, Jones Edmunds & Associates, Inc., kvirgilio@jonesedmunds.com
Marisol Alvarez, Jones Edmunds & Associates, Inc., malvarez@jonesedmunds.com
Christine Smykowski, DEP SWD, Christine.Smykowski@FloridaDEP.gov

REQUIREMENTS FOR USE OF THE GENERAL PERMIT FOR DOMESTIC WASTEWATER COLLECTION/TRANSMISSION SYSTEMS:

1. This general permit is subject to the general permit conditions of Rule 62-4.540, F.A.C., as applicable. This rule is available at the Department's Internet site at: https://floridadep.gov/water/water/content/water-resource-management-rules#ww *[62-4.540]*

2. This general permit does not relieve the permittee of the responsibility for obtaining a dredge and fill permit where it is required. *[62-604.600(6)(b)1]*

3. This general permit cannot be revised, except to transfer the permit. *[62-604.600(6)(b)2]*

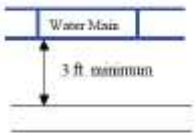
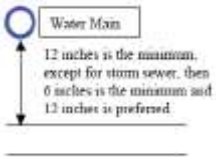
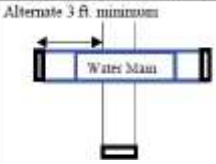
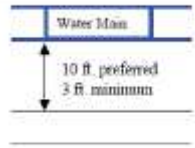
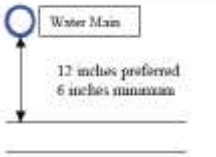
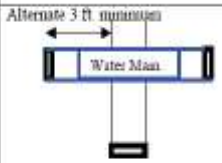
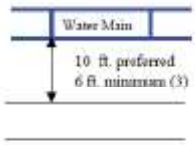
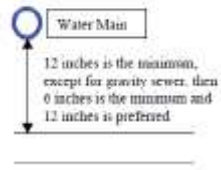
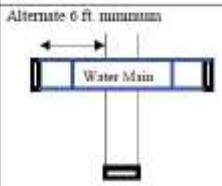
4. This general permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project. *[62-4.030]*

5. Upon completion of construction of the collection/transmission system project, and before placing the facilities into operation for any purpose other than testing for leaks or testing equipment operation, the permittee shall submit to the Department's Southwest District Office Form 62-604.300(3)(b), Request for Approval to Place a Domestic Wastewater Collection/Transmission System into Operation. This form is available at the Department's Internet site at: https://floridadep.gov/water/domestic-wastewater/content/domestic-wastewater-forms *[62-604.700(2)]*

6. The new or modified collection/transmission facilities shall not be placed into service until the Department clears the project for use. *[62-604.700(3)]*

7. Abnormal events shall be reported to the Department's Southwest District Office in accordance with Rule 62-604.550, F.A.C. For unauthorized spills of wastewater in excess of 1000 gallons per incident, or where information indicates that public health or the environment may be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER (800) 320-0519 as soon as practical, but no later than 24 hours from the time the permittee or other designee becomes aware of the circumstances. Unauthorized releases or spills less than 1000 gallons per incident are to be reported orally to the Department's Southwest District Office within 24 hours from the time the permittee, or other designee becomes aware of the circumstances. *[62-604.550]*

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH RULE 62-555.314, F.A.C.

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @ Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)			
Vacuum Sanitary Sewer			
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)			
On-Site Sewage Treatment & Disposal System	10 ft. minimum	---	---

(1) Water main should cross above other pipe. When water main must be below other pipe, the minimum separation is 12 inches.

(2) Reclaimed water regulated under Part III of Chapter 62-610, F.A.C.

(3) 3 ft. for gravity sanitary sewer where the bottom of the water main is laid at least 6 inches above the top of the gravity sanitary sewer.

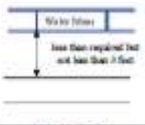
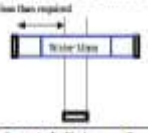
(4) Reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

EXCEPTIONS TO MINIMUM SEPARATION REQUIREMENTS

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Acceptable alternative construction features include the following:

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(a), F.A.C.

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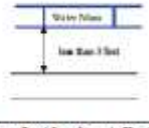
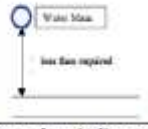
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2. Use of welded, fused, or otherwise restrained joints for either the water main or the other pipeline; **or**

3. Use of watertight casing pipe or concrete encasement at least four inches thick for either the water main or the other pipeline.

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(b), F.A.C.

Other Pipe	Horizontal Separation	Crossings
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

Where an underground water main is being laid **less than three feet horizontally** from another pipeline and where an underground water main is **crossing another pipeline and is being laid less than the required minimum vertical distance from the other pipeline**:

Use of pipe, or casing pipe, having high impact strength (i.e., having an impact strength at least equal to that of 0.25-inch-thick ductile iron pipe) or concrete encasement at least four inches thick for both the water main **and** for the other pipeline if it is new and is conveying wastewater or reclaimed water.

Disclaimer – This document is provided for your convenience only. Please refer to Rule 62-555.314, F.A.C., for additional construction requirements.

ERP

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22x34

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

CITY OF ZEPHYRHILLS, FLORIDA

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH ACIE FRASER, P.E. ON DATE ADJACENT TO SEAL.

Kenneth A Fraser — Digitally signed by Kenneth A Fraser Date: 2023.11.08 13:27:24 -05'00'

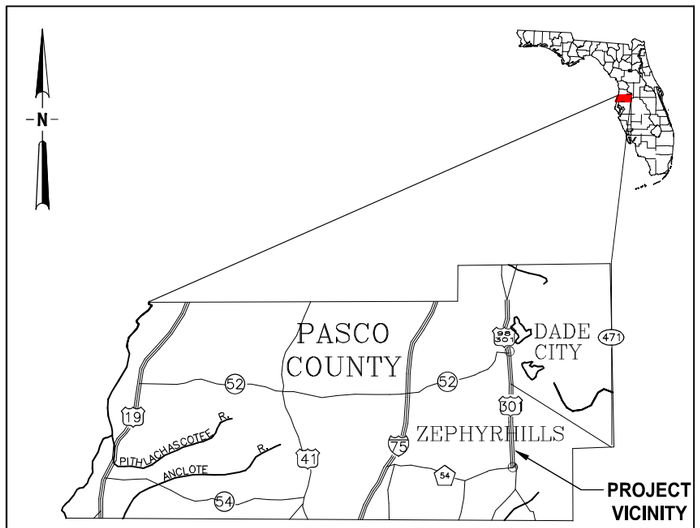
PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED, THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

JONES EDMUNDS
8657 BAYPINE ROAD, SUITE 300
JACKSONVILLE, FL 32256
E.O.R.: KENNETH ACIE FRASER, P.E., No. 57452

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING DIVISIONS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.:
GENERAL, CIVIL, EROSION CONTROL

KENNETH ACIE FRASER — LICENSE — No. 57452 — STATE OF FLORIDA — PROFESSIONAL ENGINEER

PREPARED FOR:



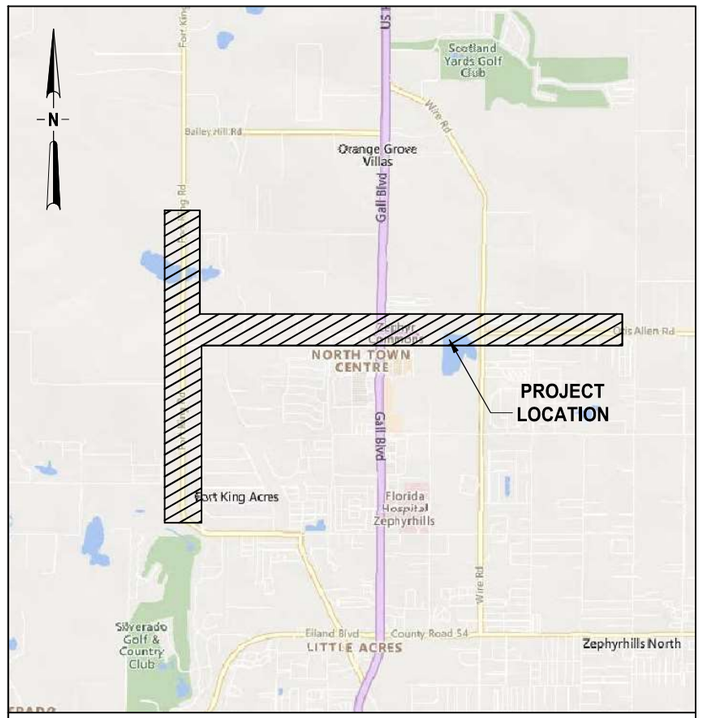
SITE VICINITY MAP

Zephyrhills Utilities Department

PREPARED BY:

JonesEdmunds

730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
324 S. HYDE PARK AVE., SUITE 250 TAMPA, FLORIDA 33606 / (813) 258-0703



PROJECT LOCATION

PROJECT # 26110-053-01

NOVEMBER 2023

BID DOCUMENTS

LAST SAVED: 11/8/2023 11:09 AMBY:KVIRGILIO PLOTTED:11/8/2023 11:10 AMBY:KEYLA VIRGILIO, EI

PLOTTED: 11/8/2023 11:10:15 AM KEYLA VIRGILIO, EI

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GENERAL NOTES

REFERENCED DATA

1. TOPOGRAPHIC SURVEY PERFORMED BY DC JOHNSON AND ASSOCIATES, 11911 SOUTH CURLEY ST. SAN ANTONIO, FL 33576 A LICENSED PROFESSIONAL LAND SURVEYOR, DATED 3/09/2023.

2. THE SURVEY INFORMATION CONTAINED HEREIN WAS OBTAINED FOR DESIGN PURPOSES AND MAY NOT BE AN ADEQUATE REPRESENTATION OF ACTUAL CONDITIONS FOR PROJECT CONSTRUCTION. ANY EXISTING CONTOURS SHOWN REPRESENT INTERPOLATIONS/EXTRAPOLATIONS FROM THE BEST AVAILABLE SURVEY DATA. ALL RISKS RESULTING FROM THE USE OR INTERPRETATION OF THE SURVEY DATA SHOWN SHALL BE BORNE BY THE CONTRACTOR.

GENERAL

3. THE CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS AND REQUIREMENTS OF ALL PERMITS (FDEP, FDOT, PASCO COUNTY BUILDING DEPARTMENT, ETC) OBTAINED FOR THIS PROJECT.

4. THE CONTRACTOR IS ADVISED NOT TO SCALE FROM DRAWINGS BUT TO FIELD VERIFY ALL DIMENSIONS. THE DIMENSIONS OF SPECIFIED AND FURNISHED PRODUCTS AND MATERIALS TAKE PRECEDENCE OVER DIMENSIONS INDICATED ON THE DRAWINGS. IF SIGNIFICANT DEVIATIONS OCCUR, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 72 HOURS PRIOR TO CONSTRUCTION FOR A DETERMINATION AND RESOLUTION.

5. THE CONTRACTOR SHALL VERIFY THAT ALL CLEARANCES CAN BE MET. IF ANY CLEARANCES CANNOT BE MET, THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IN WRITING A MINIMUM OF 15 WORKING DAYS PRIOR TO CONSTRUCTING AND SUCH ITEM.

CONSTRUCTION LAYOUT/LIMITS OF CONSTRUCTION

6. THE CONTRACTOR SHALL OBTAIN THE SERVICES OF A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF FLORIDA FOR LAYOUT AND ESTABLISHMENT OF ELEVATIONS OF NEW WORK. PROOF OF LICENSE SHALL BE SUBMITTED TO THE ENGINEER BEFORE BEGINNING LAYOUT.

7. NO DISTURBANCE SHALL BE ALLOWED OUTSIDE OF THE RIGHT OF WAYS AND/OR THE LIMITS OF CONSTRUCTION SHOWN ON THE DRAWINGS UNLESS APPROVED BY THE OWNER OR SPECIFICALLY NOTED ON THE DRAWINGS.

EXISTING CONDITIONS

8. LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES ARE SHOWN BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE DRAWINGS BUT ARE NOT PURPORTED TO BE ABSOLUTELY CORRECT. THERE MAY BE OTHER IMPROVEMENTS, UTILITIES, ETC. WHICH ARE WITHIN THE PROJECT AREA. CONTRACTOR SHALL VERIFY, PRIOR TO CONSTRUCTION, THE LOCATIONS, ELEVATIONS, DIMENSIONS, TYPES, AND CONDITIONS OF ALL EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (WHETHER OR NOT SHOWN ON THE DRAWINGS) AFFECTING THE WORK.

9. PRIOR TO SHOP DRAWING PREPARATION AND SUBMITTAL AND PURCHASE OF RELATED MATERIALS, THE CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITIES (LOCATION, SIZE, MATERIALS OF CONSTRUCTION, OUTSIDE DIAMETER, WALL THICKNESS, ROUNDNESS, ELEVATIONS, ETC.) TO WHICH CONNECTION(S) WILL BE MADE. CONTRACTOR SHALL INCLUDE FIELD MEASUREMENTS ON SHOP DRAWINGS.

10. THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IN WRITING IMMEDIATELY IF CONFLICTS BETWEEN THE DRAWINGS AND ACTUAL CONDITIONS ARE DISCOVERED. THE CONTRACTOR SHALL ACCURATELY RECORD ANY SUCH CONFLICTS ON THE RECORD DRAWINGS.

11. ANY PROPERTY CORNERS, MONUMENTS, OR BENCH MARKS WITHIN THE PROJECT AREA SHALL BE PROTECTED UNLESS OTHERWISE INDICATED FOR DEMOLITION. IF ANY SUCH ITEMS ARE IN DANGER OF DAMAGE OR HAVE BEEN DAMAGED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER IMMEDIATELY AND REPLACE/RESTORE THESE ITEMS AT NO ADDITIONAL COST TO THE OWNER. IF OWNER CHOOSES TO SELF PERFORM THE WORK OR INCURS RELATED EXPENSES, THE CONTRACTOR SHALL REIMBURSE THE OWNER FOR ALL COSTS ASSOCIATED WITH THE EFFORT.

UTILITY COORDINATION

12. THE CONTRACTOR SHALL NOTIFY ALL UTILITIES NEAR THE PROJECT AREA AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE NOTIFYING "SUNSHINE 811 CALL OF FLORIDA" AT LEAST 48 HOURS PRIOR TO ANY DIGGING WORK TO HAVE ALL EXISTING UTILITIES LOCATED. THE PHONE NUMBER IS 1-800-432-4770 AND THE WEB SITE IS WWW.SUNSHINE811.COM, IN INSTANCES WHERE DIGGING OCCURS IN WETLANDS, THE NOTIFICATION PERIOD SHALL BE INCREASED FROM AT LEAST 48 HOURS TO AT LEAST 10 DAYS.

13. FLORIDA LAW (FS 553.851) REQUIRES THAT PERSONS MAKING EXCAVATIONS IN PUBLIC STREETS, ALLEYS, RIGHT-OF-WAYS OR UTILITY EASEMENTS MUST FIRST OBTAIN INFORMATION ON LOCATIONS OF UNDERGROUND GAS PIPELINES.

14. THE CONTRACTOR SHALL PRESERVE AND MAINTAIN EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES WITHIN THE PROJECT AREA. ANY DAMAGE SHALL BE REPAIRED BY AND AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.

15. THE CONTRACTOR IS RESPONSIBLE FOR BRACING, SHORING, OR PROVIDING OTHER MEANS NECESSARY TO PROTECT AND SUPPORT EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (EXPOSED OR UNEXPOSED) THAT MAY BE IMPACTED BY THE CONTRACTOR'S WORK.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING POWER/TELEPHONE COMPANIES AND ARRANGING TO HAVE UTILITIES POLES HELD AND/OR GUY WIRES REMOVED AND REPLACED, IF NECESSARY FOR CONSTRUCTION, AT NO ADDITIONAL COST TO THE OWNER.

SAFETY

17. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE FAMILIAR WITH THE OSHA EXCAVATION SAFETY STANDARDS AND TO ABIDE BY THEM AS COVERED UNDER THE FLORIDA TRENCH SAFETY ACT.

18. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION SAFETY.

RESTORATION

19. ALL PAVING, STABILIZED EARTH, DRIVEWAYS, CURBS, SIDEWALKS, FENCES, SOD, LANDSCAPING, CULVERTS, ETC. DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE RESTORED BY AND AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.

ACCESS/MAINTENANCE OF FACILITIES

20. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL EXISTING UTILITIES/FACILITIES AND MAINTAIN UNINTERRUPTED SERVICES THROUGHOUT THE CONTRACT PERIOD.

PIPING NOTES

21. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS. CONTRACTOR SHALL TAKE CARE TO PROVIDE PROPER GRADE ELEVATIONS AND ALIGNMENTS.

22. SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE. TYPE OF JOINT AND FITTING MATERIAL SHALL BE AS SPECIFIED FOR THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE.

23. CONTRACTOR SHALL CONSTRUCT NEW BELOW GRADE PIPING WITH A MINIMUM COVER OF 36". IF A MINIMUM COVER OF 36" CANNOT BE ACHIEVED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING.

24. CONTRACTOR SHALL INSTALL MINIMUM OF 1/4" THICK NEOPRENE PADDING BETWEEN PIPE AND SUPPORTS FOR DUCTILE IRON PIPE AND PIPE WITH COATINGS.

UTILITY SEPARATION

25. EACH PROPOSED UTILITY SHALL BE LAID TO ACHIEVE THE MINIMUM HORIZONTAL SEPARATION BETWEEN IT AND OTHER UTILITIES IN ACCORDANCE WITH THE TYPICAL UTILITY HORIZONTAL SEPARATION DETAIL AND FDEP REQUIREMENTS.

26. AT LOCATIONS WHERE A PROPOSED UTILITY CROSSES ANOTHER UTILITY, THE PROPOSED UTILITY SHALL BE INSTALLED IN ACCORDANCE WITH THE TYPICAL UTILITY CONFLICT DETAIL AND FDEP REQUIREMENTS.

27. IN THE EVENT THAT A UTILITY CONFLICT CAN NOT BE RESOLVED BY MAKING A MINOR ROUTE ADJUSTMENT OR BY UTILIZING THE TYPICAL UTILITY CONFLICT DETAIL, THE CONTRACTOR SHALL SUBMIT A RELOCATION PLAN TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCING WORK. ALL RELOCATION EFFORTS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER AND ANY AFFECTED UTILITY COMPANIES.

PROJECT SPECIFIC

28. ALL UTILITIES SHALL BE KEPT IN OPERATION EXCEPT WITH THE WRITTEN CONSENT OF THE UTILITY OWNER.

29. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING EXISTING UTILITIES AND PAVEMENT THAT THE CONTRACTOR DAMAGES DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER. REPAIRS SHALL BE CONDUCTED UNDER THE SUPERVISION OF THE OWNER AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND THESE DRAWINGS.

30. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF TWO WEEKS NOTICE TO THE OWNER PRIOR TO CONNECTING THE NEW CONSTRUCTION, EQUIPMENT, AND PIPING TO THE CITY OF ZEPHYRHILLS WWTF. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND SCHEDULING EACH CONNECTION WITH THE OWNER TO ENSURE THAT THERE ARE MINIMAL INTERRUPTIONS TO EACH SYSTEM.

31. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AND STABILIZING POWER POLES DURING CONSTRUCTION. THE CONTRACTOR SHALL CONTACT THE ELECTRIC UTILITY PROVIDER AND COORDINATE WITH THEM.

32. CONTRACTOR SHALL REMOVE TREE(S) WHEN IN DIRECT CONFLICT W/ PROPOSED WORK, AS APPROVED BY THE ENGINEER. CONTRACTOR SHALL OBTAIN PERMIT(S) REQUIRED.

33. PLEASE NOTE EXISTING UTILITIES AS SHOWN IN THE DRAWINGS ARE BASED ON GIS DATA. CONTRACTOR SHALL VERIFY EXISTING UTILITIES LOCATIONS PRIOR TO CONSTRUCTION.

SPECIAL REQUIREMENTS TO HAND-DIG EXCAVATIONS FOR EXISTING UTILITY COORDINATION

34. PLEASE NOTE AREAS OF EXISTING UTILITIES IN CLOSE PROXIMITY TO THE PROPOSED INSTALLATION HAVE BEEN NOTED WITH DASHED RECTANGULAR BOXES SHOWN IN THE PLANS.

35. IN THE NOTED AREAS AND OTHER AREAS IDENTIFIED DURING CONSTRUCTION, THE CONTRACTOR SHALL HAND DIG ALL EXCAVATIONS WITHIN 10 FEET IN ALL DIRECTIONS OF A MARKED LOCATED UTILITY LINE.

36. THE CONTRACTOR SHALL ALSO HAND DIG A PILOT TRENCH WHEN CALLED FOR ON THE DIG PERMIT FOR ALL UNDERGROUND UTILITY WORK ALONG THE CENTERLINE OF NEW TRENCHES AND DOWN TO THE BOTTOM ELEVATION OF THE NEW UTILITY.

37. MACHINE EXCAVATION SHALL PROCEED ONLY AFTER IT IS DETERMINED THAT ALL EXISTING UTILITIES HAVE BEEN IDENTIFIED AND PROTECTED.

HORIZONTAL DIRECTIONAL DRILL NOTES

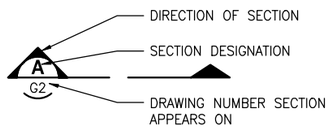
38. BORING LAYOUT BASED ON MINIMUM RADIUS OF 400 FEET. MAXIMUM BACK REAMER DIAMETERS SHALL BE
    13.6-INCH FOR 8-INCH DR-11 HDPE PIPE
    10.4-INCH FOR 6-INCH DR-11 HDPE PIPE

39. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNERS FOR ACCESS DURING UTILITY INSTALLATION.

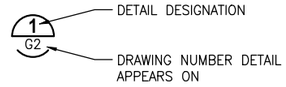
40. BORE DEPTH ON BORES BENEATH FDOT ROADWAY PAVEMENT SHALL BE 10X THE BACK REAMER SIZE PER UAM 3.16.9.1.

DRAWING INDEX

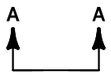
Sheet Number	Sheet Title
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G3	ABBREVIATIONS
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CIVIL	
C1	FORT KING RD PLANVIEW
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C4	FORT KING RD PLANVIEW
C5	KOSSIK RD PLANVIEW
C6	KOSSIK RD PLANVIEW
C7	KOSSIK RD PLANVIEW
C8	KOSSIK RD PLANVIEW
C9	OTIS ALLEN RD PLANVIEW
C10	OTIS ALLEN RD PLANVIEW
C11	HDD PROFILES
C12	HDD PROFILES
C13	HDD PROFILES
CIVIL DETAILS	
C14	CIVIL DETAILS
C15	CIVIL DETAILS
C16	CIVIL DETAILS
C17	CIVIL DETAILS
C18	CIVIL DETAILS
C19	CIVIL DETAILS
EROSION CONTROL	
EC1	STORMWATER POLLUTION PREVENTION DETAILS
EC2	STORMWATER POLLUTION PREVENTION DETAILS
EC3	STORMWATER POLLUTION PREVENTION DETAILS



SECTION DESIGNATION



DETAIL DESIGNATION



INDICATES ONE OR MORE SECTIONS CUT SHOWN ON THE SAME DETAIL

SECTION DESIGNATION

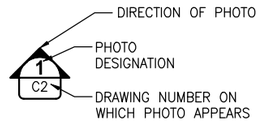


PHOTO DESIGNATION

BID DOCUMENTS

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

DRAWING INDEX, GENERAL NOTES AND DESIGNATION

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DWG NO: G2

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STANDARD ABBREVIATIONS

&	AND
@	AT
A	AUTOMATIC
AA STD	ALUMINUM ASSOCIATION STANDARD
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AB	ALIGNMENT BEGINNING
AC	ASBESTOS CEMENT
AC	ALTERNATING CURRENT
AC	AIR CONDITIONER
ACI	AMERICAN CONCRETE INSTITUTE
ADJ	ADJUSTABLE
AE	ALIGNMENT END
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIP	ABANDONED IN PLACE
AISI	AMERICAN IRON STEEL INSTITUTE
AIT	ANALYTICAL INDICATING TRANSMITTER
ALT	ALTERNATIVE
ALUM	ALUMINUM
AM	AUTO–MANUAL
AMPS	AMPERES
ANSI	AMERICAN NATION STANDARDS INSTITUTE
AP	ANALYZER PANEL
APP	APPROVE, APPROVED
APPROX	APPROXIMATE
AR	AIR RELEASE
ARV	AIR RELEASE VALVE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASD	ADJUSTABLE SPEED DRIVE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AVE	AVENUE
AWG	AMERICAN WIRE GUAGE
AWS	AMERICAN WELDING SOCIETY
AWWA	AMERICAN WATER WORKS ASSOCIATION
B	BORING
B/	BOTTOM OF
B/L	BASELINE OF CONSTRUCTION
BC	BARE COPPER
BF	BLIND FLANGE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BKR	BREAKER
BLD	BLIND
BLDG	BUILDING
BLVD	BOULEVARD
BM	BENCH MARK
BMP	BEST MANAGEMENT PRACTICE
BO	BLOW–OFF
BTM	BOTTOM
BTM/	BOTTOM OF
BV	BALL VALVE
BYP	BYPASS
C	CONDUIT, CONDUCTOR, CLOSE
C/L, CL	CENTERLINE
CAM	COMPUTER–AUTO–MANUAL
CAT	CATALOGUE
CB	CIRCUIT BREAKER
CC	CENTER TO CENTER
CCS	CENTRAL CONTROL SYSTEM
CF	COLUMN FOUNDATION
CFWE	CABLE FURNISHED WITH EQUIPMENT
CI	CAST IRON
CIP	CAST IN PLACE, CAST IRON PIPE
CISP	CAST IRON SLIP PIECE
CJ	CONSTRUCTION/CONTRACTION JOINT
CLF	CHAIN LINK FENCE
CLR	CLEAR
CM	COMPUTER–MANUAL
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
CO	COMPANY
COL	COLUMN
COM	COMMUNICATION
CON	CONCENTRIC
CONC	CONCRETE
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CORP	CORPORATION
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CRE	CORROSION RESISTANT
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
CS	CARBON STEEL
CT	CURRENT TRANSFORMER, CABLE TRAY CONTACTOR
CTRD	CENTERED
CV	CHECK VALVE
D	DRAIN
DB	DUCT BANK
DBI	DITCH BOTTOM INLET
DC	DIRECT CURRENT
DES	DESIGNATION
DET	DETAIL
DI	DUCTILE IRON
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DIPS	DUCTILE IRON PIPE SIZE
DIV	DIVISION
DN	DOWN, DAMPER
DR	DIMENSION RATIO
DWG	DRAWING
DXS	DOUBLE EXTRA STRONG
E	EAST(ING)
EA	EACH
ECC	ECCENTRIC
EES	EMERGENCY EYEWASH AND SHOWER
EF	EACH FACE, EXHAUST FAN
EG	SUCH AS
EJ	EXPANSION JOINT
EL, ELEV	ELEVATION
ELB	ELBOW
ELEC	ELECTRICAL
EOP	EDGE OF PAVEMENT
EQ	EQUAL
ERCP	ELLIPTICAL REINFORCED CONCRETE PIPE
EST	ELEVATED STORAGE TANK
ETC	ETCETERA
EW	EACH WAY
EXIST	EXISTING
FBC	FLORIDA BUILDING CODE
F, FU	FUSE
F/F	FINISHED FLOOR
FAB	FABRICATED
FAC	FLORIDA ADMINISTRATIVE CODE
FCA	FLANGED COUPLING ADAPTER
FCV	FLOW CONTROL VALVE
FDEP	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
FDN	FOUNDATION
FDOT	FLORIDA DEPARTMENT OF TRANSPORTATION
FDR	FEEDER
FE	FLOW ELEMENT
FF	FINISHED FLOOR
FFE	FINISHED FLOOR ELEVATION
FG	FINISHED GRADE, FIBERGLASS
FH	FIRE HYDRANT
FIG	FIGURE
FIN	FINISHED
FIT	FLOW INDICATING TRANSMITTER
FJ	FLANGED JOINT
FL	FLOOR
FLEX	FLEXIBLE
FLG	FLANGE(D)
FND	FOUNDATION
FNPT	FEMALE NATIONAL PIPE THREAD
FO	FIBER OPTIC
FOS	FAST–OFF–SLOW
FOSA	FAST–OFF–SLOW–AUTO
FOSR	FAST–OFF–SLOW–REMOTE
FP	FULL PENETRATION, FIELD PANEL
FR	FORWARD–REVERSE
FREQ	FREQUENCY
FRP	FIBER REINFORCED PLASTIC
FS	FLORIDA STATUTES, FAR SIDE, FLOW SWITCH
FT	FOOT
G	GROUND
GAL	GALLON
GALV	GALVANIZED
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERUPTER
GND	GROUND
GPM	GALLONS PER MINUTE
GR	GRADE
GRTG	GRATING
GS	GALVANIZED STEEL
GSP	GALVANIZED STEEL PIPE
GST	GROUND STORAGE TANK
GV	GATE VALVE
H	HIGH
HA	HAND AUGER
HD	HAND
HDD	HORIZONTAL DIRECTIONAL DRILL
HDNS	HARDNESS
HDPE	HIGH DENSITY POLYETHYLENE
HHWL	HIGH HIGH WATER LEVEL
HK	HOOK
HOA	HAND–OFF–AUTO
HOR	HAND–OFF–REMOTE
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HR	HANDRAIL
HSP	HIGH SERVICE PUMP
HT	HEIGHT
HWL	HIGH WATER LEVEL
I&C	INSTRUMENTATION AND CONTROL
IC	INTERRUPTING CAPACITY
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
IF	INSULATED FLANGE
IJ	ISOLATION JOINT
INC	INCORPORATED
IPS	IRON PIPE SIZE
J, JB	JUNCTION BOX
JT	JOINT
KA	KILOAMPERES
KB	KNEE BRACE
KCMIL	THOUSAND CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT AMPERES
KW	KILOWATTS
KWH	KILOWATT HOUR
L	LOWER
LB, LBS	POUND(S)
LE	LEVEL ELEMENT
LEL	LOWER EXPLOSIVE LIMIT
LF	LINEAR FEET
LG	LONG
LIT	LEVEL INDICATING TRANSMITTER
LIU	LIGHT INTERFACE UNIT
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LLWL	LOW LOW WATER LEVEL
LOS	LOCKOUT STOP
LR	LONG RADIUS, LOCAL–REMOTE
LS	LIFT STATION
LSIG	LONG SHORT INSTANTANEOUS GROUND
LWL	LOW WATER LEVEL
M	MAGNETIC CONTACTOR COIL, MOTOR, MANUAL
M/F	MALE/FEMALE
MAX	MAXIMUM
MC	MODULATE–CLOSE
MCC	MOTOR CONTROL CENTER
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MES	MITERED END SECTION
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MNPT	MALE NATIONAL PIPE THREAD
MO	MOTOR OPERATOR
MP	METERING PUMP
MPH	MILES PER HOUR
MS	MOTOR STARTER
MSC	MANUFACTURER SUPPLIED CABLE
MT, MTD	MOUNT(ED)
MTL	METAL
MV	MEDIUM VOLTAGE
N	NORTH(ING), NEUTRAL, NORMAL
N/A	NOT APPLICABLE
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NC	NORMALLY CLOSED
NE	NORTH EAST
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NPT	NATIONAL PIPE THREAD
NPW	NON POTABLE WATER
NRS	NONRISING STEM
NS	NEAR SIDE
NSF	NATIONAL SANITATION FOUNDATION
NTS	NOT TO SCALE
NW	NORTH WEST
OC	ON CENTER(S), OPEN–CLOSE(D)
OCA	OPEN–CLOSE–AUTO
OCR	OPEN–CLOSE–REMOTE
OD	OUTSIDE DIAMETER
OF	OVERFLOW
OO	ON–OFF
OOA	ON–OFF–AUTO
OOR	ON–OFF–REMOTE
OPP	OPPOSITE
ORP	OXIDATION REDUCTION POTENTIAL
OS&Y	OUTSIDE STEM AND YOKE
OSC	OPEN–STOP–CLOSE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
P&ID	PIPING AND INSTRUMENTATION DIAGRAM
P/L	PROPERTY LINE
PB	PULL BOX
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PCV	PRESSURE CONTROL VALVE
PE	PLAIN END, POLYETHYLENE
PET	POLYETHYLENE TUBING
PF	POWER FACTOR
pH	HYDROGEN ION CONCENTRATION
PH	PHASE
PI	POINT OF INTERSECTION/PLANT INFLUENT
PID	PROPORTIONAL INTEGRAL DERIVATIVE
PIT	PRESSURE INDICATING TRANSMITTER
PIV	POST INDICATOR VALVE
PL	PLATE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PLCS	PLACES
POC	POINT OF CONNECTION
POE	POINT OF ENTRY
POJ	PUSH ON JOINT
PP	POWER POLE
PPE	PERSONAL PROTECTIVE EQUIPMENT
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSID	POUNDS PER SQUARE INCH DIFFERENTIAL
PSIG	POUNDS PER SQUARE INCH GAUGE
PSV	PRESSURE SUSTAINING VALVE
PT	PRESSURE TREATED, POTENTIAL TRANSFORMER
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PW	POTABLE WATER
PWR	POWER
R	RADIUS
R/W, ROW	RIGHT–OF–WAY
RCP	REINFORCED CONCRETE PIPE
RCPT	RECEPTACLE
RED	REDUCER
REF	REFERENCE
REINF	REINFORCEMENT, REINFORCING
REQ, REQ'D	REQUIRED
RGS	RIGID GALVANIZED STEEL
RJ	RESTRAINED JOINT
RM	REMOTE MULTIPLEXING MODULE
RMS	ROOT MEAN SQUARE
RPZ	REDUCED PRESSURE ZONE
RT	RIGHT
RTU	REMOTE TELEMETRY UNIT
SARV	SURGE ANTICIPATOR RELIEF VALVE
SBC	STANDARD BUILDING CODE
SCH	SCHEDULE
SCJ	SAW CUT JOINT
SDI	STEEL DECK INSTITUTE
SE	SOUTH EAST
SEC	SECOND
SF	SLOWER–FASTER
SHEC	SHOULDERED–END COUPLING
SHT	SHEET
SIM	SIMILAR
SJI	STEEL JOINT INSTITUTE
SM	STATIC MIXER
SP	SPACING, SPACED
SPD	SURGE PROTECTIVE DEVICE
SQ	SQUARE
SR	STATE ROAD, SURGE RELIEF
SRV	SURGE RELIEF VALVE
SS	START–STOP
SS, SST	STAINLESS STEEL
SSC	SUPERVISORY SET POINT CONTROL
SSRV	SOLID STATE REDUCED VOLTAGE
ST	SHUNT TRIP
STA	STATION
STD	STANDARD
STL	STEEL
STS	STORMWATER SEWER
SW	SOUTH WEST, SWITCH
SWD	SIDE WATER DEPTH
SWJ	SOLVENT WELD JOINT
SWPPP	STORM WATER POLLUTION PREVENTION PLAN
SY	SQUARE YARD
T, THK	THICK
T/	TOP OF
T/B,T&B	TOP AND BOTTOM
TBM	TEMPORARY BENCHMARK
TEMP	TEMPERATURE
TGS	THREADED GALVANIZED STEEL
TGSP	THREADED GALVANIZED STEEL PIPE
TH	TOTAL HEAD
THERMO	THERMOSTATIC
THD	THREADED
TJB	TERMINAL JUNCTION BOX
TK	TANK
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TOSJ	TOP OF STEEL JOIST
TOW	TOP OF WALL
TS	TUBULAR STEEL
TSF	THICKENED SLAB FOOTING
TSP	TWISTED SHIELDED PAIR
TURB	TURBIDITY
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITER'S LABORATORIES
ULC	ULTRASONIC LEVEL CONTROLLER
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTAGE, VOLTS
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VH	VAPOR HEATER
VIB	VIBRATION
VIF	VERIFY IN FIELD
VP	VAPORIZER
W	WIDE, WATT
W/	WITH
W/O	WITHOUT
WCJ	WALL CONTROL JOINT
WF	WALL FOOTING
WGT	WEIGHT
WP	WORK POINT, WEATHERPROOF
WSE, WSEL	WATER SURFACE ELEVATION
WT	WEIGHT
WV	WATER VALVE
WWF	WELDED WIRE FABRIC
XFMR	TRANSFORMER
XS	EXTRA STRONG

CUSTOM ABBREVIATIONS

COZ	CITY OF ZEPHYRHILLS
SWFWMD	SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
ISO	ISOMETRIC
EOR	ENGINEER OR RECORD
WM	WATER MAIN
FM	FORCE MAIN

NOTES:
1. SEE LEGENDS AND PIPE SCHEDULE FOR ADDITIONAL ABBREVIATIONS.
2. NOT ALL ABBREVIATIONS MAY BE USED FOR THIS PROJECT.

BID DOCUMENTS

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LTR.	DATE	REVISIONS	BY	APPRD.

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

ABBREVIATIONS

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26110-053-01	NOV. 2023
INDEX NO:	DWG NO: G3

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MECHANICAL LEGEND

CIVIL LEGEND

- CONTOURS (90)
- MATCHLINE
- RIGHT-OF-WAY BOUNDARY
- PROPERTY BOUNDARY
- EASEMENT BOUNDARY
- CENTERLINE
- WATERMAIN LINE (WM)
- FORCEMAIN LINE (FM)
- GAS LINE (G)
- ELECTRICAL LINE (E)
- CHLORINE LINE
- SILT FENCE (SF)
- TURBIDITY BARRIER (TB)
- DEMO HATCH
- WETLAND (WL)
- SPOT ELEVATION (+100.00)
- REINFORCED CONCRETE PIPE (RCP)
- TRENCH DRAIN
- MITERED END SECTION (S-1) W/ STRUCTURE DESIGNATION
- FLARED END SECTION (S-1) W/ STRUCTURE DESIGNATION
- DITCH BOTTOM INLET (S-1) W/ STRUCTURE DESIGNATION
- COORDINATE POINT
- PROPOSED SIGN
- CONCRETE
- LIMEROCK
- COMPACTED SOIL
- GRAVEL
- ASPHALT RESTORATION
- FORCEMAIN FLOW DIRECTION
- POTENTIAL UTILITY CONFLICT

PIPING SYMBOLS

DOUBLE LINE	SINGLE LINE	
		PIPE
		WELDED PIPE
		FLANGED JOINT
		MECHANICAL JOINT OR RESTRAINED PUSH-ON JOINT
		FLEXIBLE COUPLING ADAPTER
		EXPANSION JOINT
		HUB & SPIGOT JOINT
		BALL JOINT
		FLANGED COUPLING ADAPTER W/ THRUST TIES
		FLEXIBLE COUPLING WITH THRUST TIES
		BLIND FLANGE
		ELBOW UP
		ELBOW DOWN
		TEE UP
		TEE DOWN
		FEMALE QUICK DISCONNECT FITTING
		MALE QUICK DISCONNECT FITTING

DOUBLE LINE	SINGLE LINE	
		LATERAL UP
		LATERAL DOWN
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		UNION
		CAP
		ANCHOR
		WYE
		TEE
		CROSS
		ELBOW, 90 DEGREE
		ELBOW, 45 DEGREE
		ELBOW, 22.5 DEGREE
		ABANDON IN PLACE
		DEMOLISH AND REMOVE

VALVE SYMBOLS

- GATE
- BUTTERFLY
- BALL
- CHECK
- DIAPHRAGM
- NEEDLE
- PRESSURE RELIEF
- AIR RELEASE AND/OR VACUUM RELIEF
- REGULATED SIDE
- HYDRAULIC CONTROL VALVE

ACTUATOR SYMBOLS

- M XX — ELECTRIC MOTOR
- EH XX — ELECTROHYDRAULIC
- P XX — PNEUMATIC
- H XX — HYDRAULIC
- S — SOLENOID
- T — MANUAL

NOTE:

ON LOSS OF PRIMARY POWER
(PNEUMATIC, ELECTRICAL OR HYDRAULIC)
XX: FO = FAIL OPEN
FC = FAIL CLOSED
FLP = FAIL TO LAST POSITION

PIPE SUPPORT SYMBOLS

- U-SHAPED PIPE SUPPORT
- FLANGED PIPE SUPPORT
- PIPE SUPPORT W/ AXIAL LOAD SUPPORT

PIPE SCHEDULE NOTES:

GENERAL NOTES:
1. COAT BURIED AND SUBMERGED PIPE PER PIPE SPECIFICATIONS.
2. TEST LINES PER SECTION 15144 UNLESS NOTED OTHERWISE.
3. LABEL ALL PIPING PER SECTION 15075.

RESTRAINT SYSTEM NOTES:
(1) SEE RESTRAINT DETAILS C14

SPECIFIC NOTES:
(A) DISINFECT PIPING PER SECTION 15141.

PIPE SCHEDULE

ABBREVIATION	FLOW STREAM IDENTIFICATION	PIPE/DUCT MATERIAL	PIPE MATERIAL ABBREV	DIMENSION RATIO (DR)	SPECIFICATION NUMBER	PIPE LINING	NORMAL MAX OPERATING PRESSURE (PSIG)	FIELD TEST PRESSURE (PSIG)	EXPOSED PIPE PAINT SYSTEM	COLOR CODE	SPECIFIC NOTES	RESTRAINT SYSTEM NOTES
FM-1	FORCE MAIN	POLYVINYL CHLORIDE	PVC	18	15291	N/A		150	N/A	GREEN	N/A	(1)
FM-2	FORCE MAIN	HIGH DENSITY POLYETHYLENE	HDPE	11	15155	N/A		160	N/A	GREEN	N/A	(1)
WM-1	WATER MAIN	POLYVINYL CHLORIDE	PVC	18	15291	N/A		150	N/A	GREEN	N/A	(1)

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CHECKED D PLAVCAN

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

LEGENDS AND PIPE SCHEDULE

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SURVEYOR'S NOTES:

1. USE OF THIS SURVEY FOR PURPOSES OTHER THAN INTENDED, WITHOUT WRITTEN VERIFICATION, WILL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO THE SURVEYOR. NOTHING HEREIN SHALL BE CONSTRUED TO GIVE ANY RIGHTS OR BENEFITS TO ANYONE OTHER THAN THOSE CERTIFIED TO. THIS SURVEY MEETS THE "STANDARDS OF PRACTICE" SET FORTH BY THE FLORIDA BOARD OF LAND SURVEYORS IN CHAPTER 5J-17 FLORIDA ADMINISTRATIVE CODE.

2. THIS SURVEY WAS PREPARED WITHOUT AN ABSTRACT OF TITLE; THEREFORE THE UNDERSIGNED MAKES NO GUARANTEES OR REPRESENTATIONS REGARDING INFORMATION SHOWN HEREON PERTAINING TO EASEMENTS, RIGHTS-OF-WAY, SETBACK LINES, AGREEMENTS, RESERVATIONS, OR OTHER SIMILAR MATTERS.

3. NO INSTRUMENTS OF RECORD REFLECTING EASEMENTS, RIGHT-OF-WAYS AND/OR OWNERSHIP WERE FURNISHED TO THE UNDERSIGNED EXCEPT AS SHOWN.

4. NO UNDERGROUND INSTALLATIONS, IMPROVEMENTS OR ENCROACHMENTS, HAVE BEEN LOCATED EXCEPT THOSE SHOWN HEREON.

5. ELEVATIONS SHOWN HEREON ARE BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), NATIONAL GEODETIC SURVEY BENCHMARK "V 662", LOCATED ALONG GALL BOULEVARD IN ZEPHYRHILLS, FL, PUBLISHED ELEVATION = 107.53' (NAVD88).

6. BEARINGS AND DISTANCES SHOWN HEREON ARE FIELD MEASURED, UNLESS OTHERWISE INDICATED.

7. THE TEXT FOR TIES TO IMPROVEMENTS INDICATES THE DIRECTION THEY LIE IN RELATION TO THE BOUNDARY.

8. SUBJECT PROPERTY MAY CONTAIN LANDS THAT ARE SUBJECT TO JURISDICTION OR RESTRICTION BY ONE OR MORE OF THE FOLLOWING AGENCIES: ARMY CORP. OF ENGINEERS, SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (S.W.F.W.M.D.) OR FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (F.D.E.P.).

SURVEYOR'S LEGEND

IP, IR = IRON PIPE, IRON ROD
R/W = RIGHT-OF-WAY
O.R. = OFFICIAL RECORDS BOOK
PG. = PAGE
EL. = ELEVATION
I.E. = INVERT ELEVATION
T.C. = TOP OF CURB
E.P. = EDGE OF PAVEMENT
PVC = POLY-VINYL CHLORIDE PIPE
RCP = REINFORCED CONCRETE PIPE
CMP = CORRUGATE METAL PIPE
HDPE = HIGH-DENSITY POLYETHYLENE PIPE
= SET 5/8" IR "DC JOHNSON LB 4514"
= SET NAIL & DISK "LB 4514"
= VERTICAL CONTROL BENCHMARK
= POWER POLE/TELEPHONE POLE
= LIGHT POLE
= GUY ANCHOR
= BOLLARD
= ROADSIGN
= REFLECTOR SIGN
= MAILBOX
= CLEANOUT
= CHAIN LINK FENCE
= VINYL FENCE
= WIRE FENCE
= WOOD FENCE
91.5 = SPOT ELEVATION
= CAMPHOR TREE (SIZE AS NOTED)
= CHERRY LAUREL TREE (SIZE AS NOTED)
= MAGNOLIA TREE (SIZE AS NOTED)
= OAK TREE (SIZE AS NOTED)
= PALM TREE (SIZE AS NOTED)
= PINE TREE (SIZE AS NOTED)

= TREE (UNKNOWN VARIETY)
= STORM MANHOLE
= SANITARY MANHOLE
= GATE VALVE - SANITARY
= AIR RELEASE VALVE - SANITARY
= WATER METER
= GATE VALVE - WATER
= AIR RELEASE VALVE - WATER
= WATER LINE WITNESS POST
= FIRE HYDRANT
= FIRE DEPARTMENT CONNECTION
= GATE VALVE - FIRE
= RECLAIMED WATER METER
= GATE VALVE - RECLAIMED
= BACKFLOW PREVENTER - RECLAIMED
= UTILITY VAULT/HAND HOLE
= GATE VALVE
= AIR RELEASE VALVE
= ELECTRIC METER
= ELECTRIC BOX
= ELECTRIC TRANSFORMER
OHP = OVERHEAD POWER LINE
= GAS VALVE
= GAS LINE WITNESS POST
= TELEPHONE EQUIPMENT BOX
= TELEPHONE PEDESTAL
= TELEPHONE LINE WITNESS POST
= FIBER OPTIC VAULT/HAND HOLE
= FIBER OPTIC WITNESS POST
= TRAFFIC SIGNAL POLE
= PEDESTRIAN SIGNAL POLE
TC = TRAFFIC CONTROL BOX
= TRAFFIC CONTROL VAULT/HAND HOLE
TC = TRAFFIC CONTROL LINE
= ASPHALT
= CONCRETE
= GRAVEL/DIRT ROAD

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

SURVEY LEGEND AND NOTES

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

KEY MAP

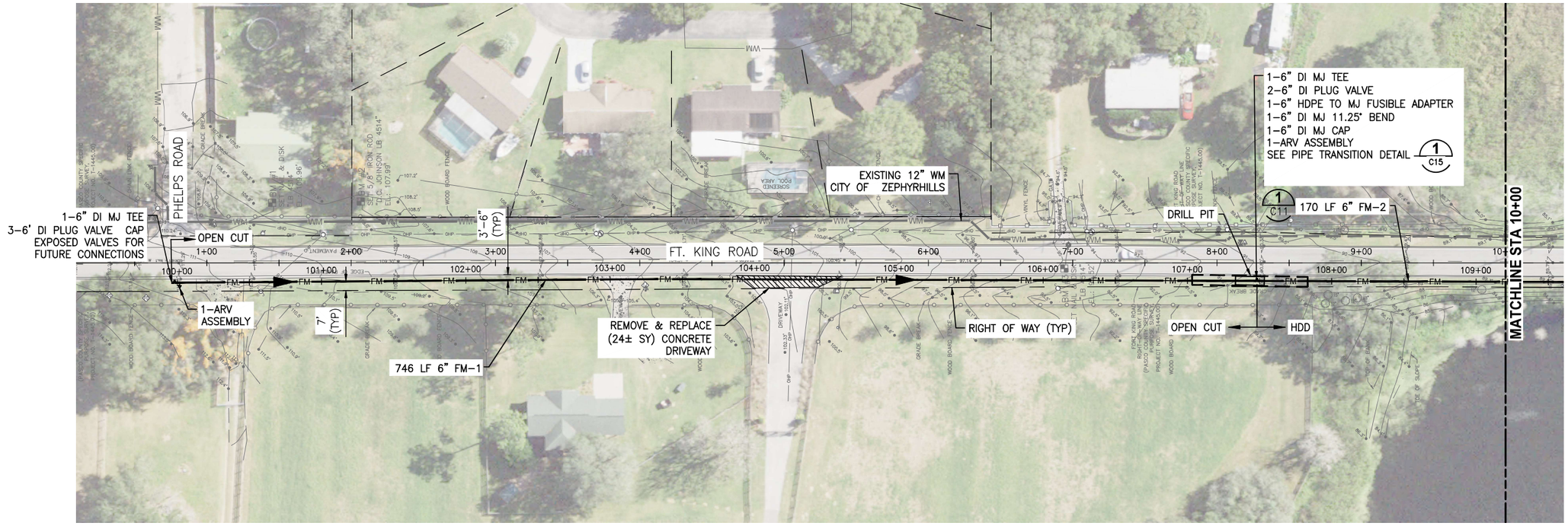
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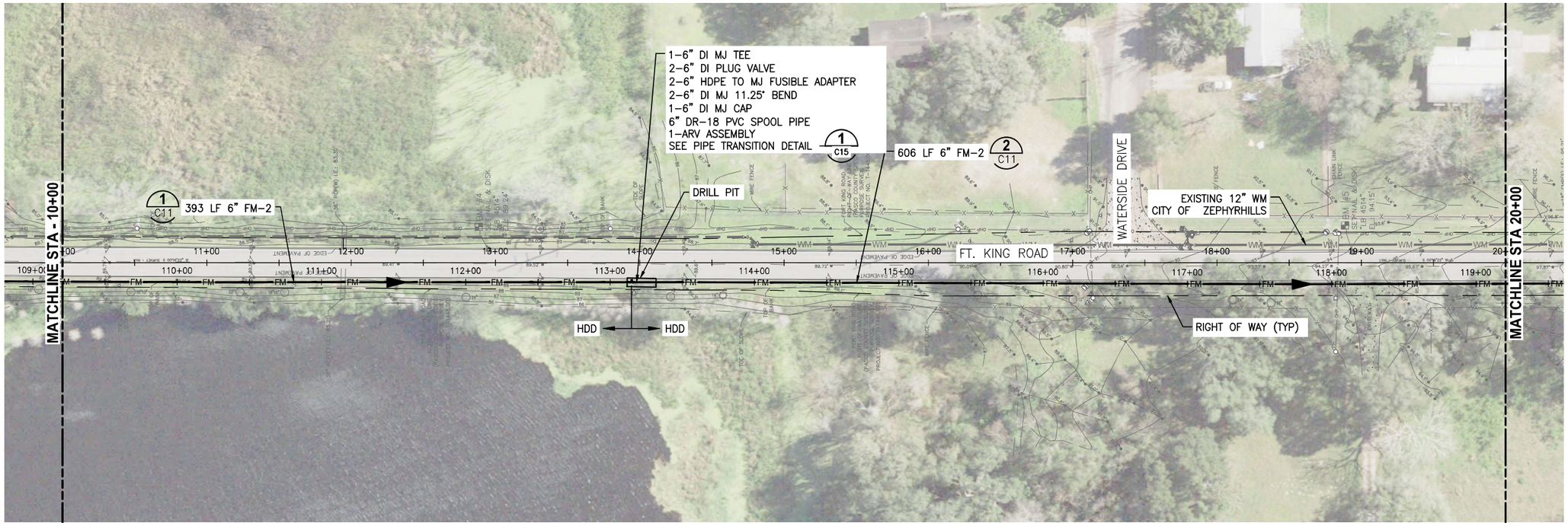
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DWG NO: G6

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NORTHSIDE PHASE 3 FORCE MAIN \
WATER LINE EXTENSION

FORT KING RD PLANVIEW

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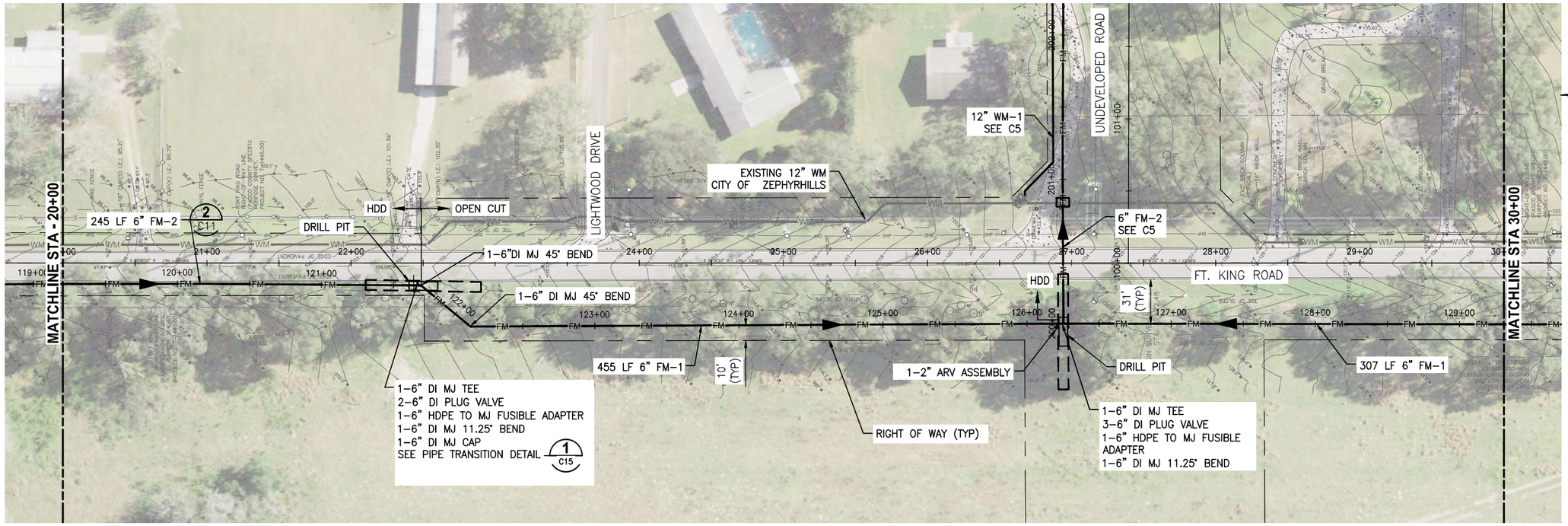
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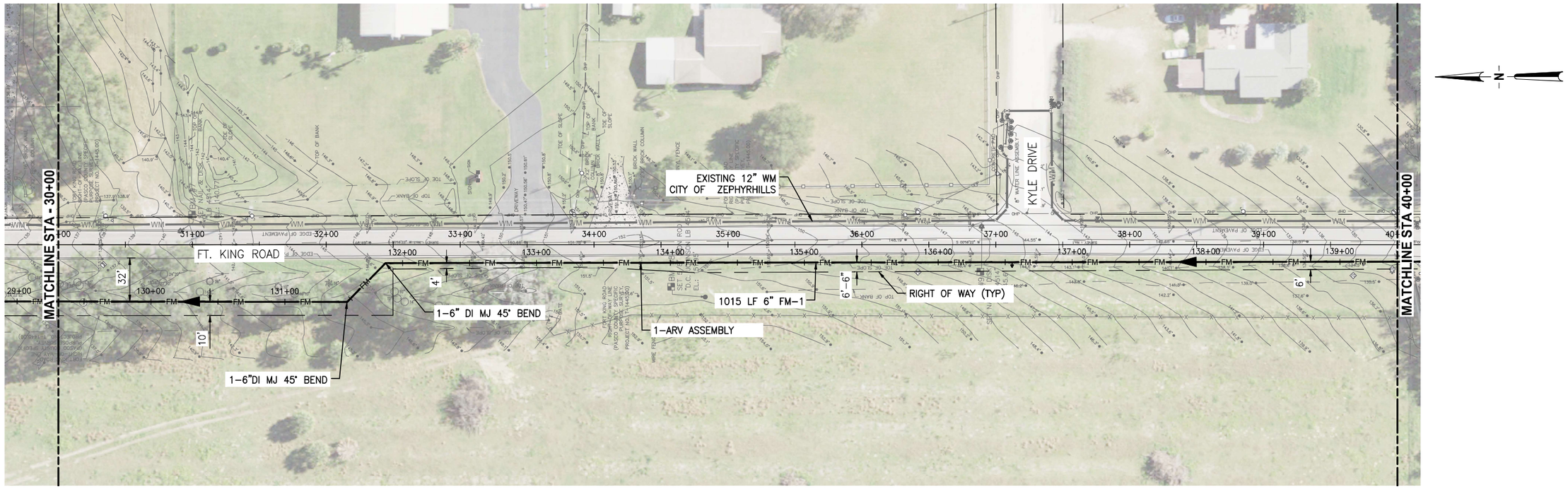
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INDEX NO:	DWG NO: C1

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NORTHSIDE PHASE 3 FORCE MAIN \
WATER LINE EXTENSION

FORT KING RD PLANVIEW

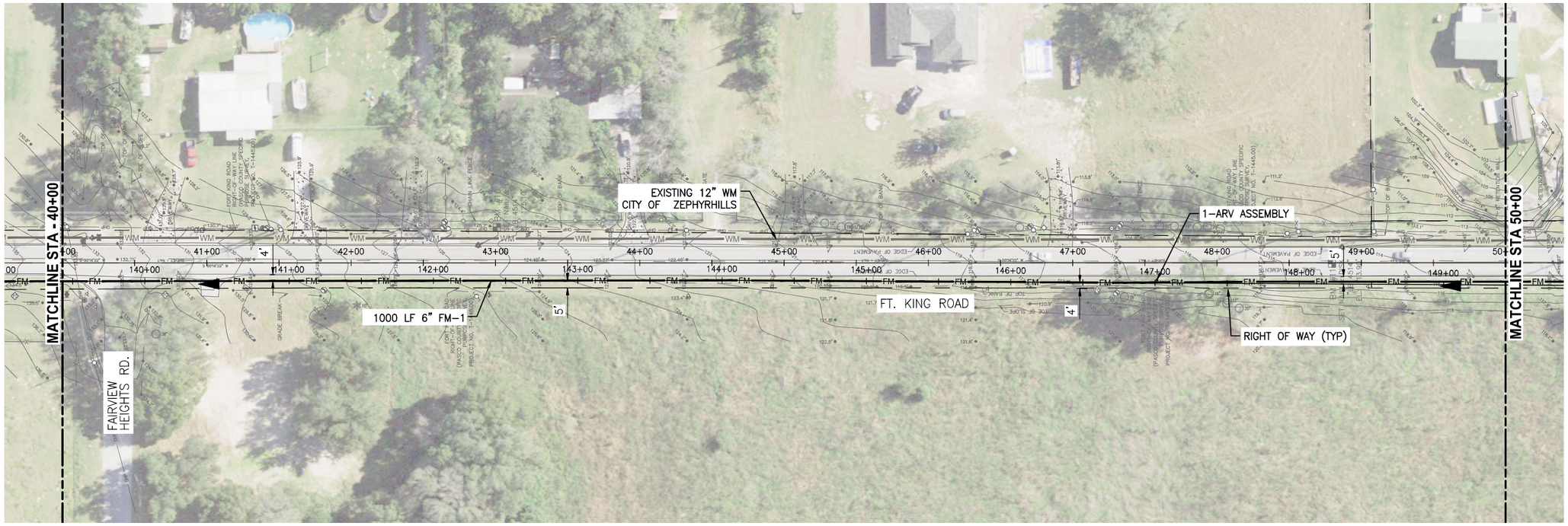
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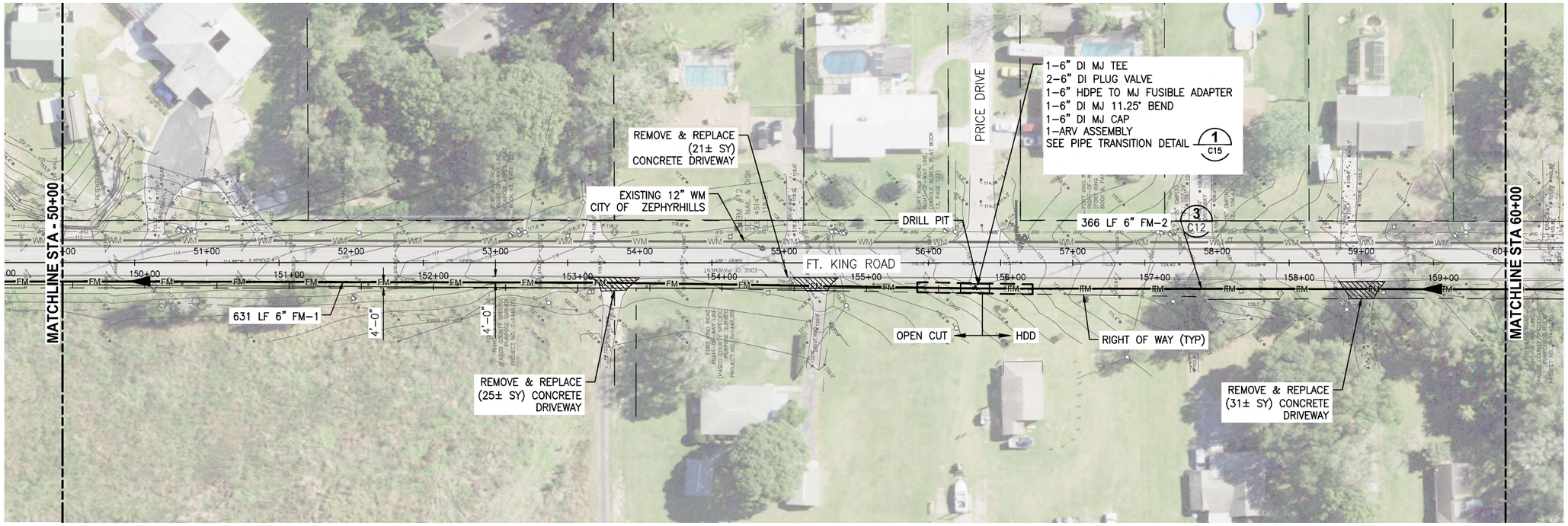
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NORTHSIDE PHASE 3 FORCE MAIN \
WATER LINE EXTENSION

FORT KING RD PLANVIEW

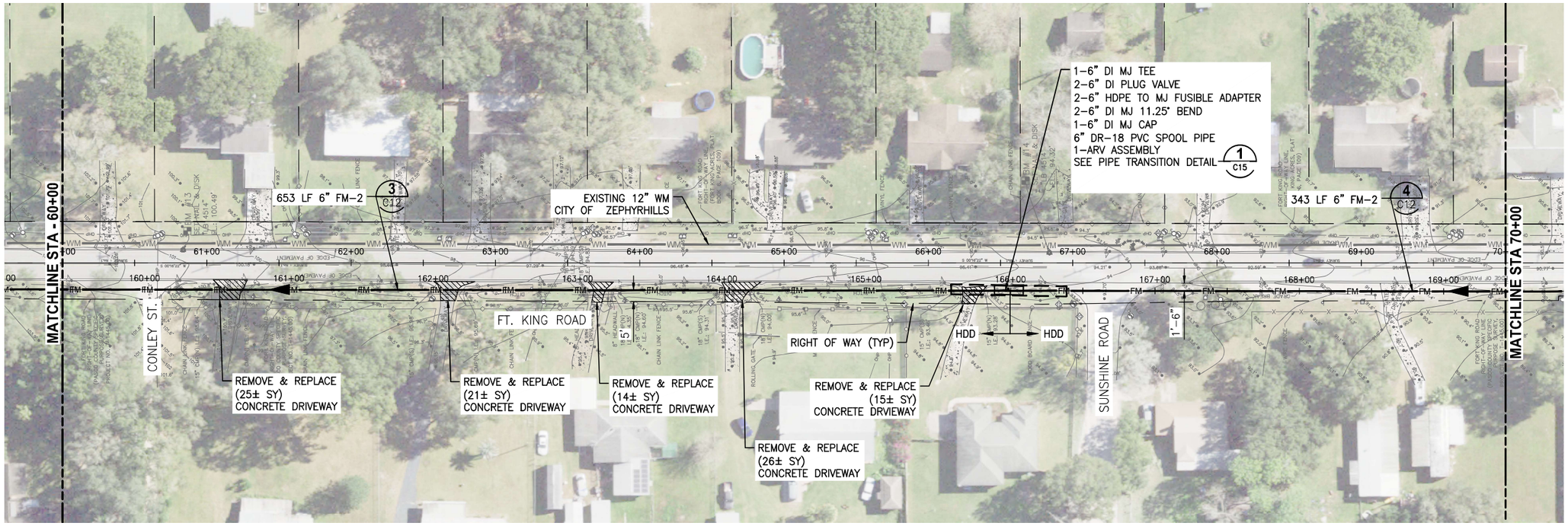
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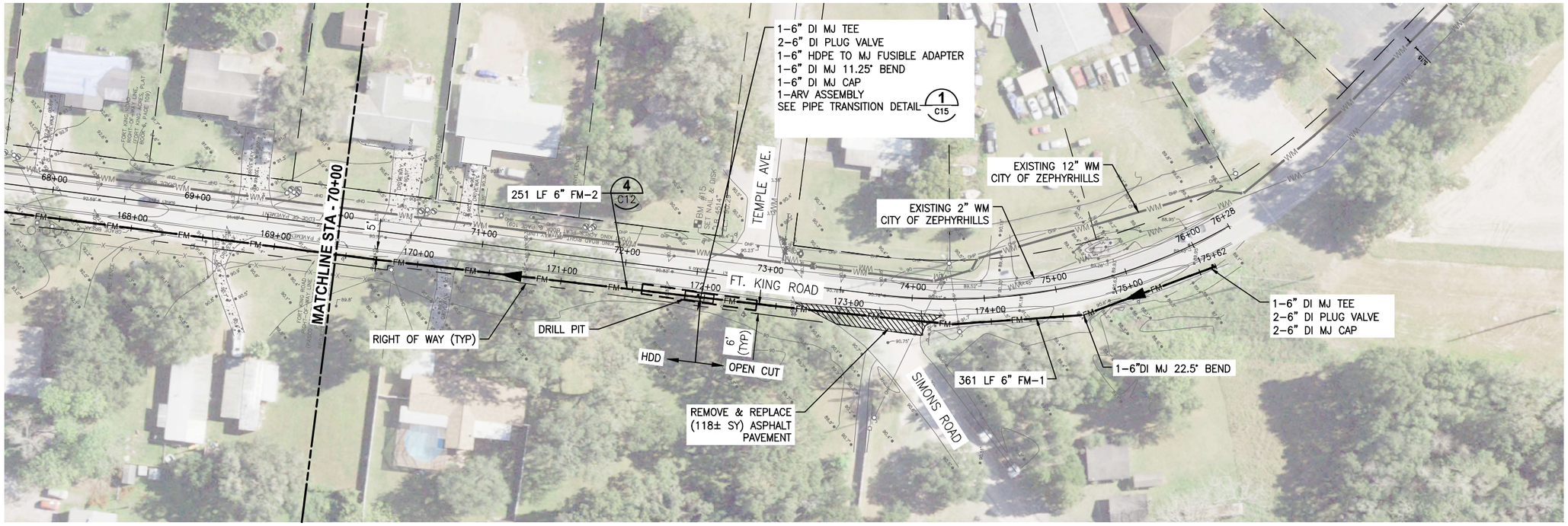
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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

FORT KING RD PLANVIEW

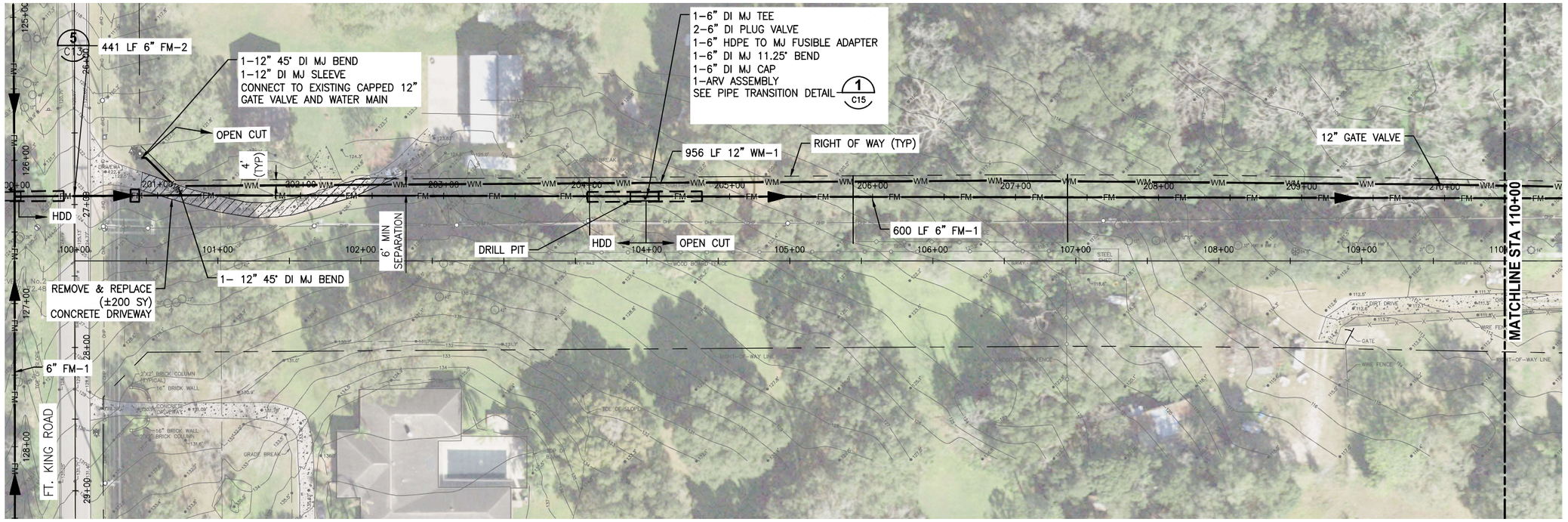
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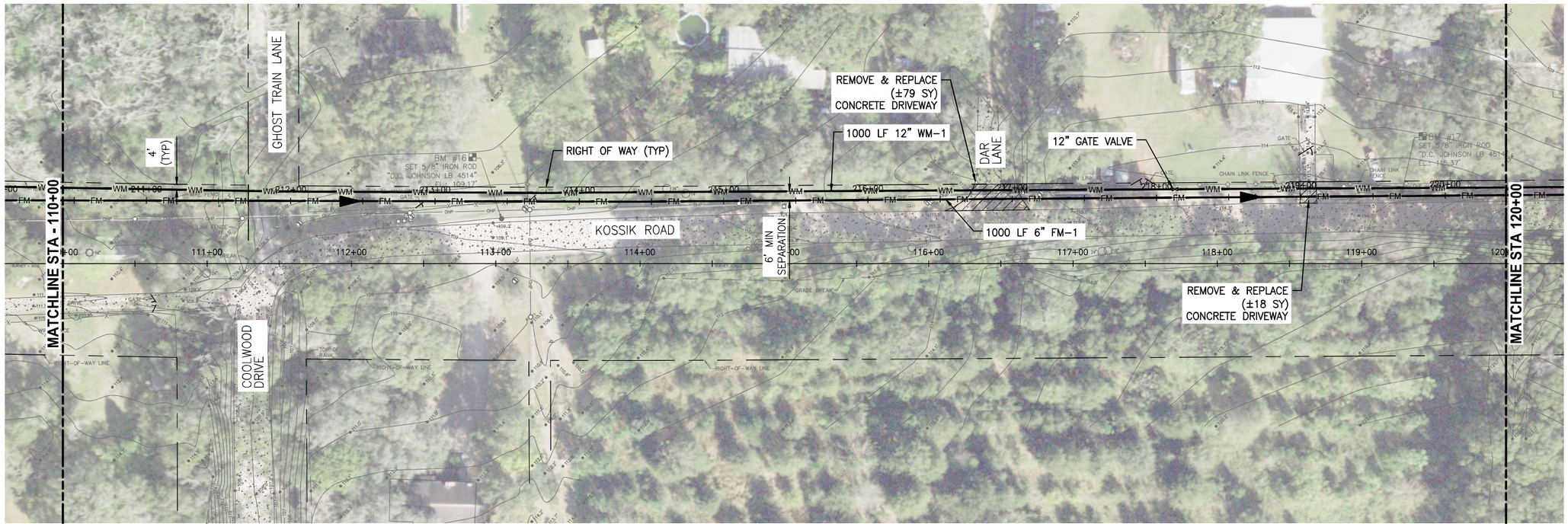
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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

KOSSIK RD PLANVIEW

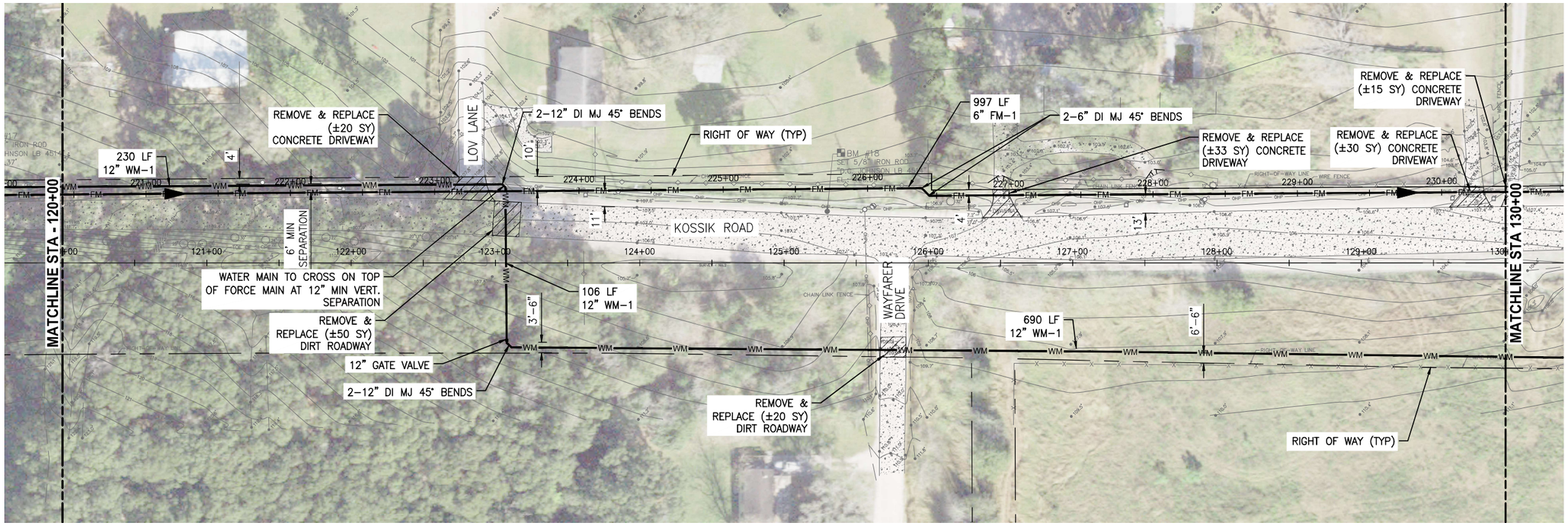
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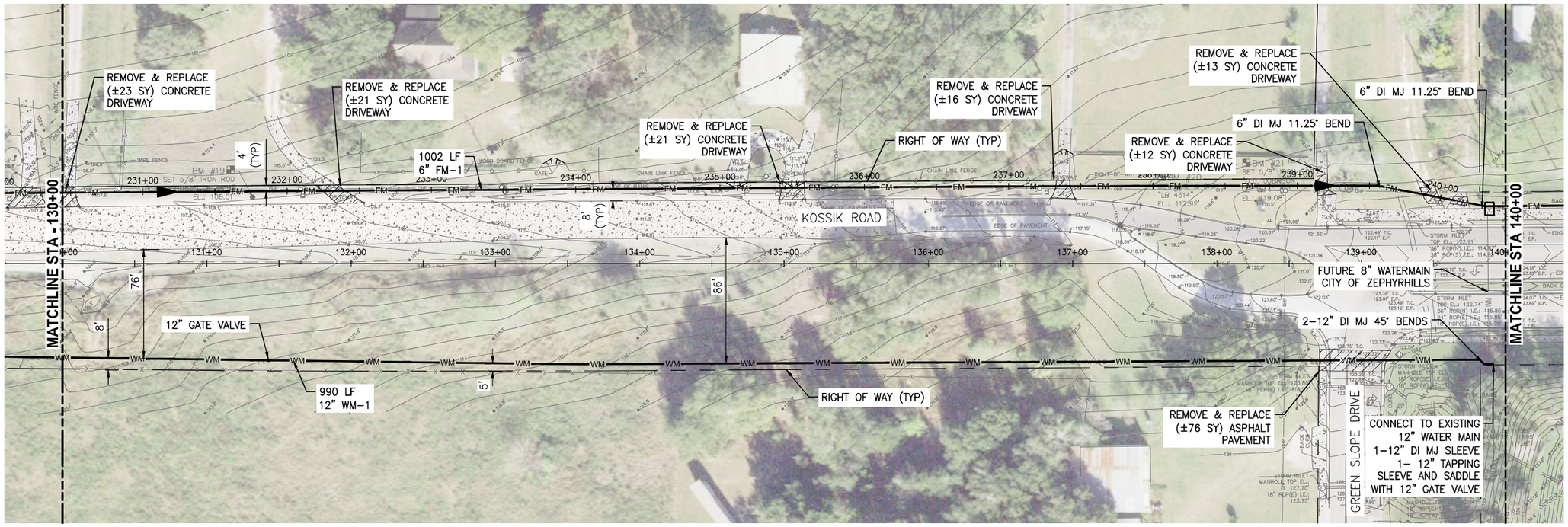
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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

KOSSIK RD PLANVIEW

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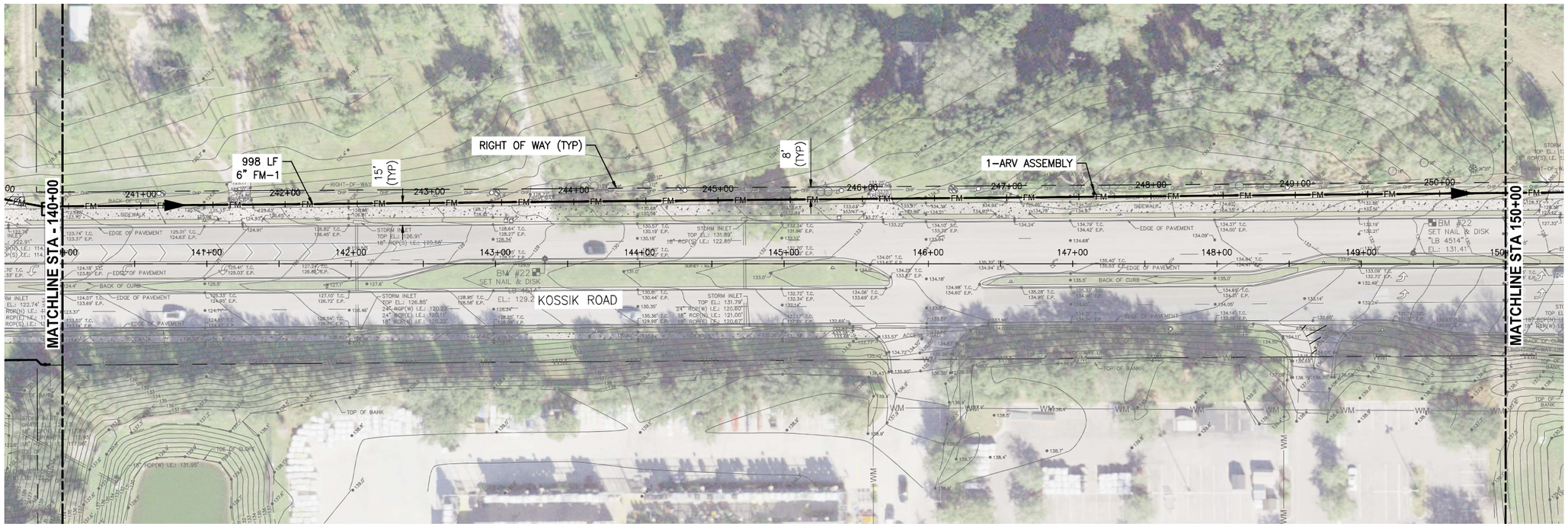
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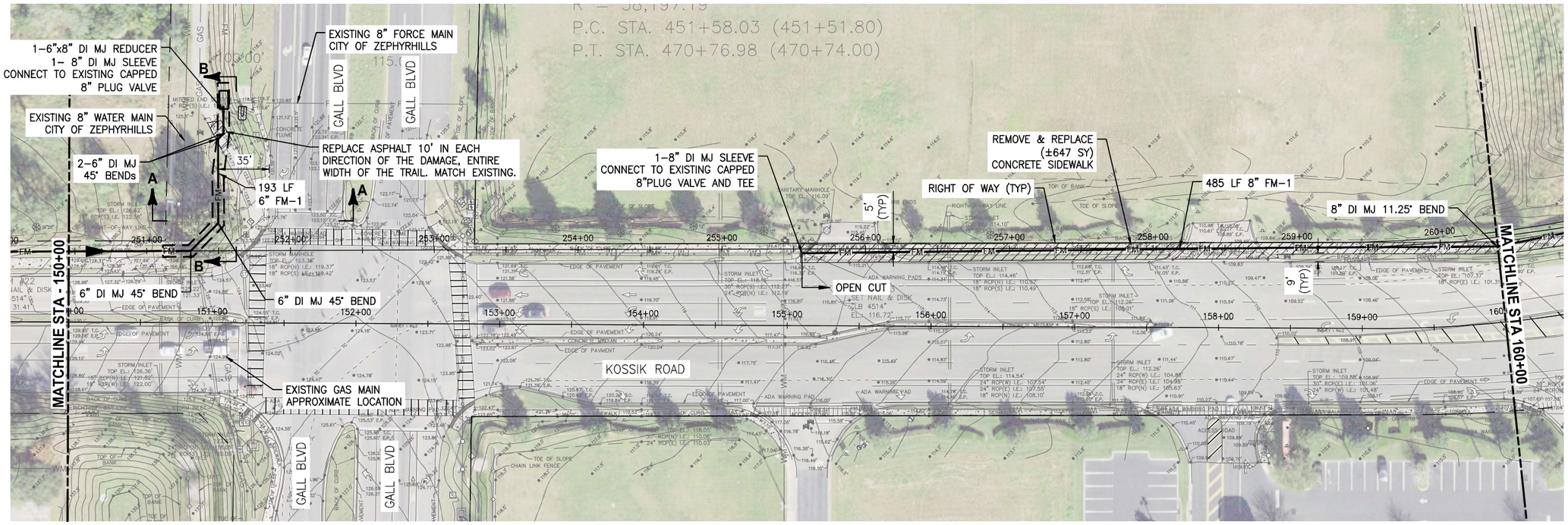
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INDEX NO:	DWG NO: C6

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

KOSSIK RD PLANVIEW

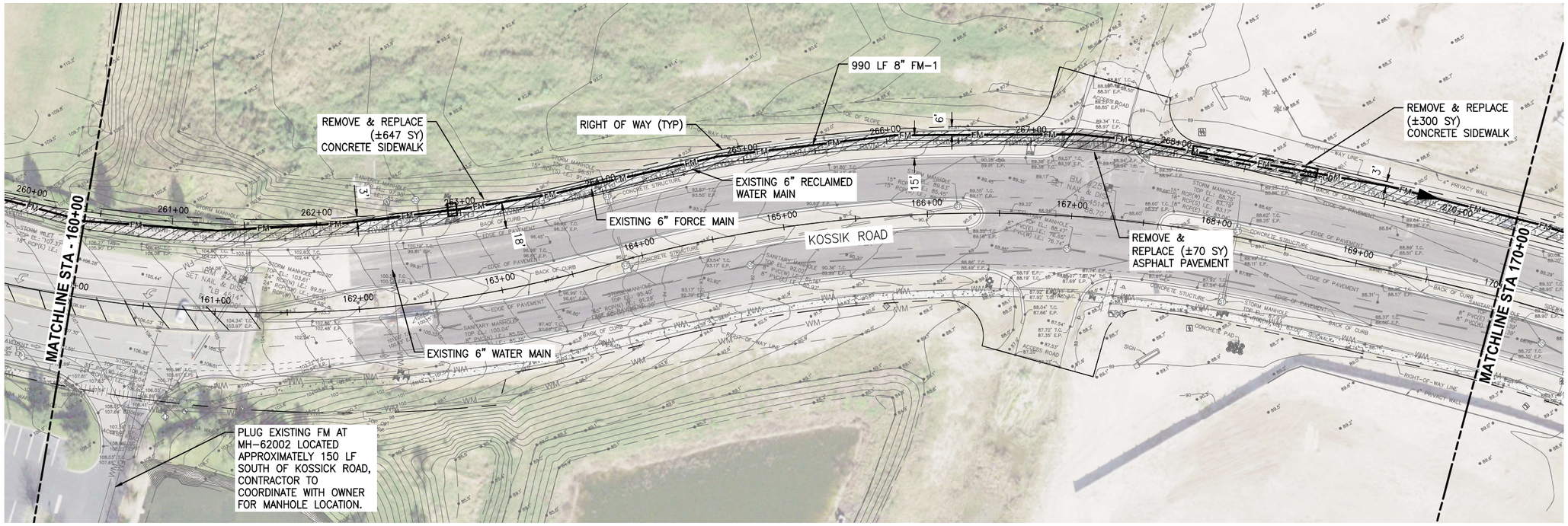
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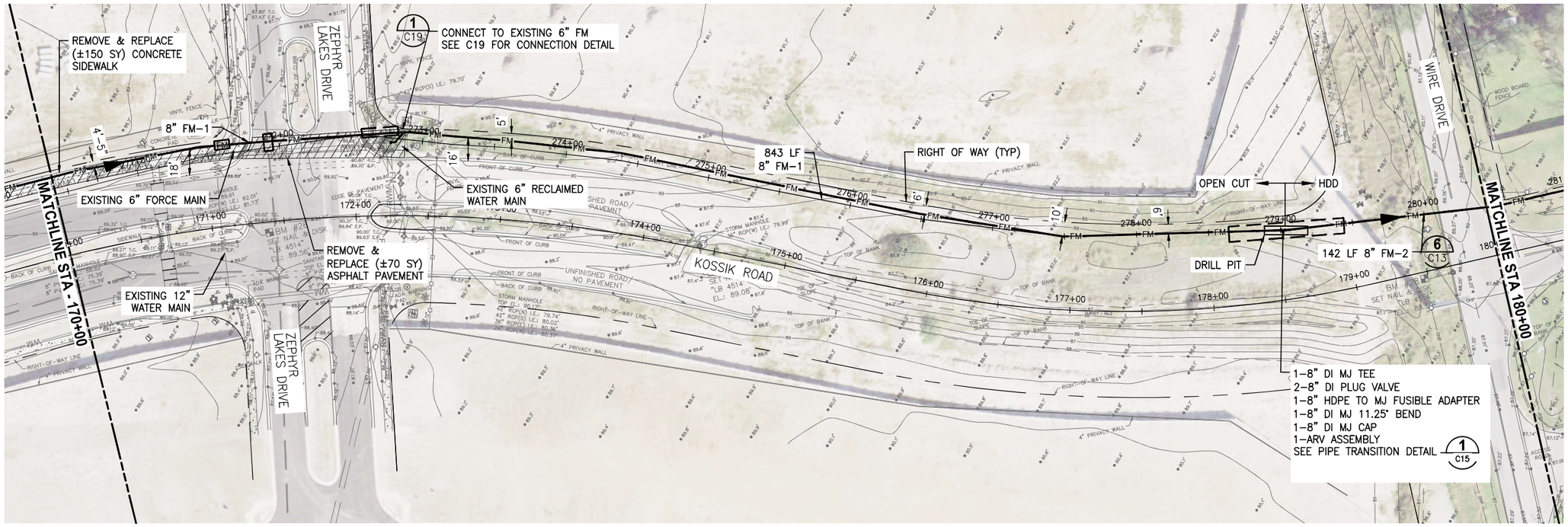
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PROJECT NO:	DATE:
26110-053-01	NOV. 2023
INDEX NO:	DWG NO: C7

SAVED: 10/27/2023 3:06 PM KFRASER Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\053-01 NORTH SIDE LS PHASE 3\DESIGN&CONSTRUCTION\CAD\DWGS\CIVIL\26110053O1-C05.DWG

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GRAPHIC SCALE
0 20 40 80
SCALE IN FEET

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8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

KOSSIK RD PLANVIEW

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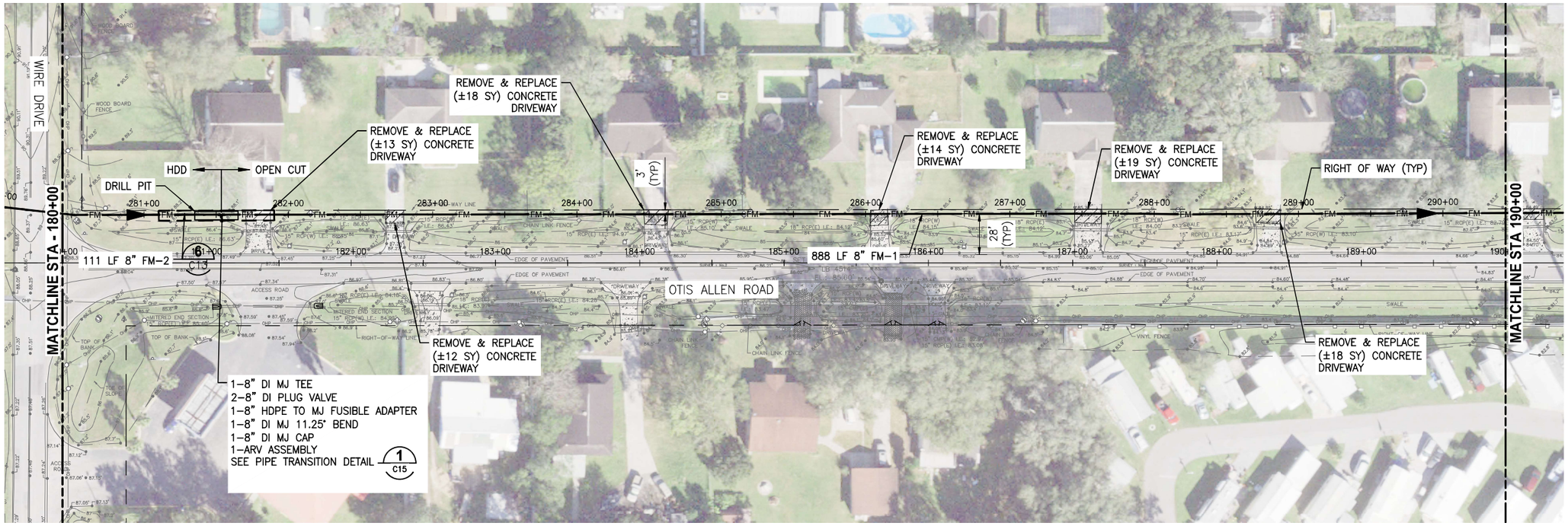
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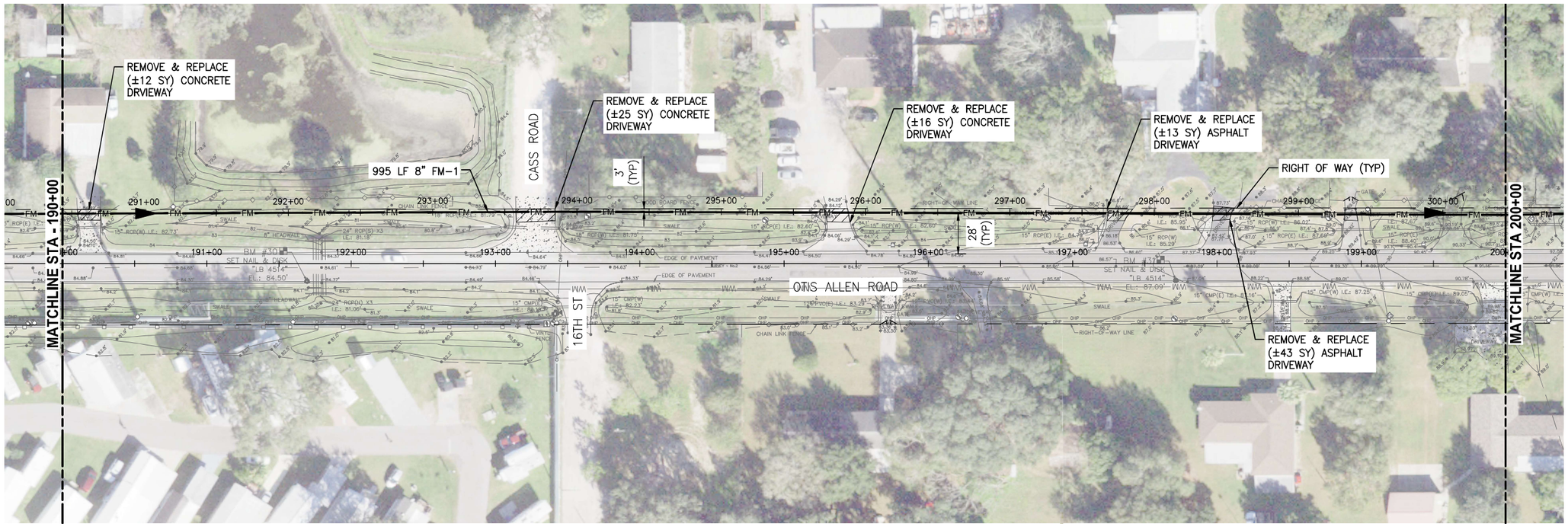
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26110-053-01	NOV. 2023
INDEX NO:	DWG NO: C8

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

OTIS ALLEN RD PLANVIEW

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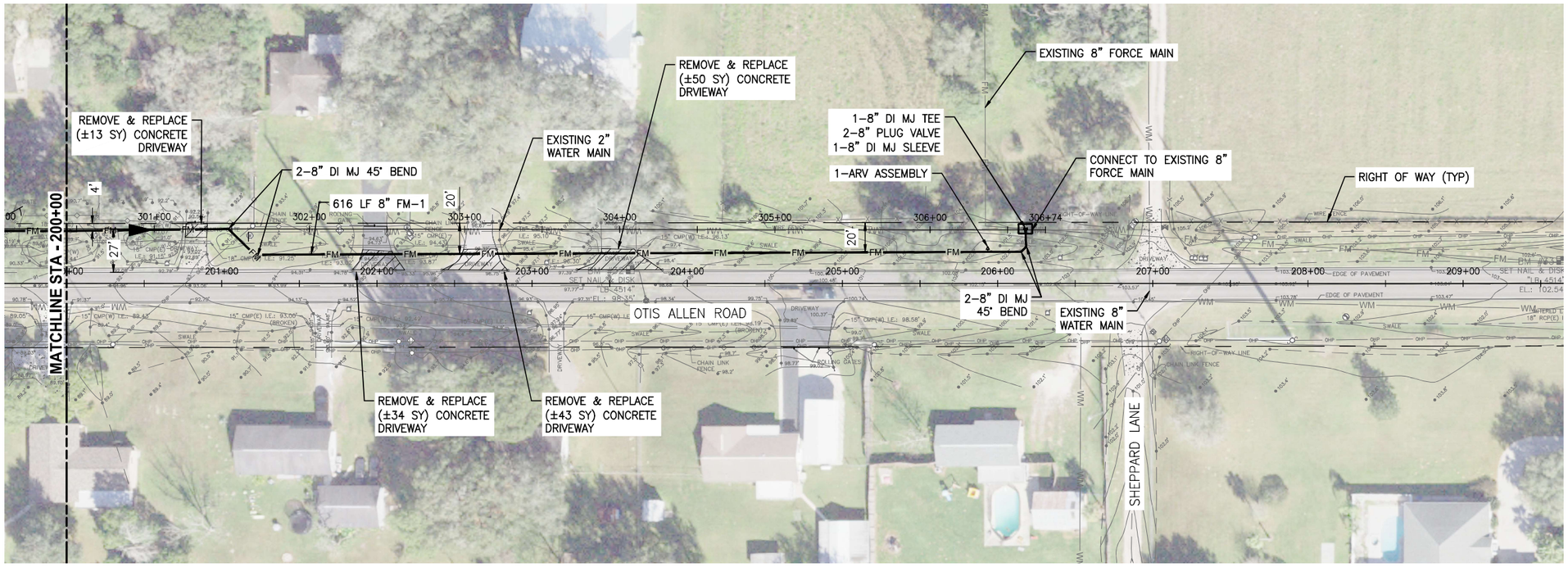
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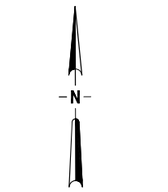
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26110-053-01	NOV. 2023
INDEX NO:	DWG NO: C9

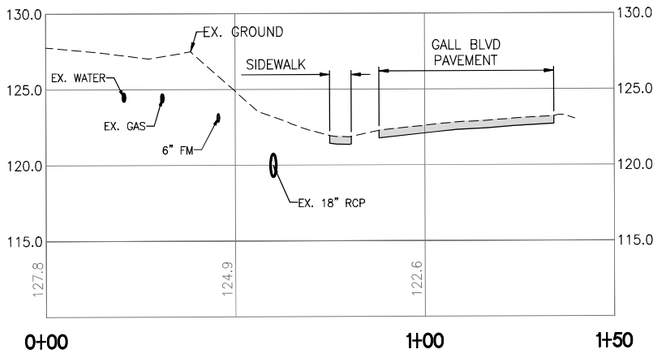
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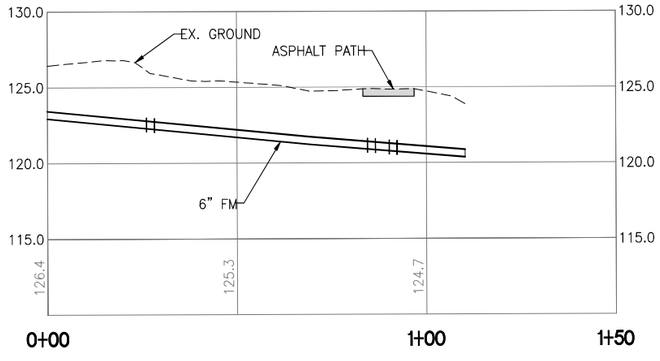
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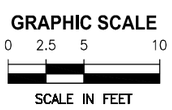




SECTION A-A (C7)



SECTION B-B (N.T.S.) (C7)



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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

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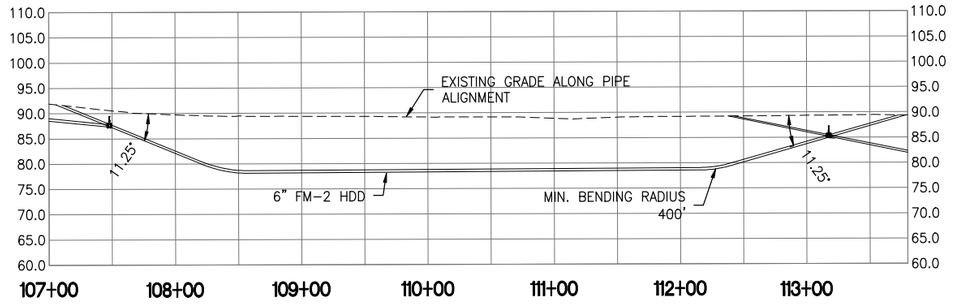
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INDEX NO:	DWG NO: C10

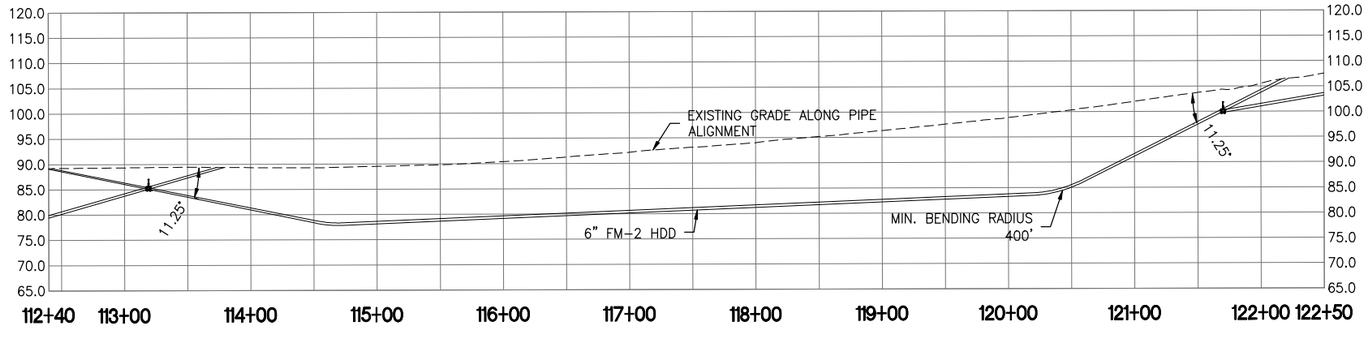
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FM HDD PROFILE 1
C1



FM HDD PROFILE 2
C1

GRAPHIC SCALE
0 0.5 1 2
SCALE IN FEET
1" = 10' V

GRAPHIC SCALE
0 30 60 120
SCALE IN FEET
1" = 60' H

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8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

HDD PROFILES

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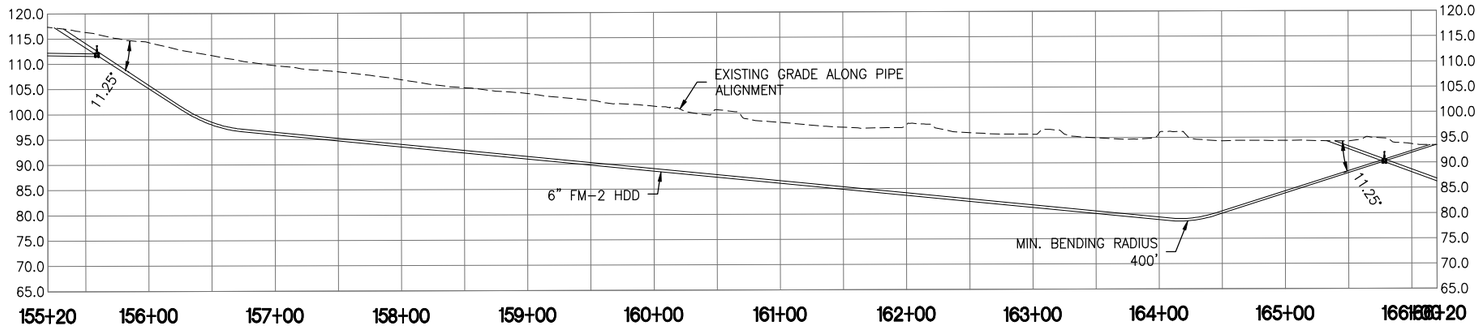
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PROJECT NO: 26110-053-01
DATE: NOV. 2023
INDEX NO:
DWG NO: C11

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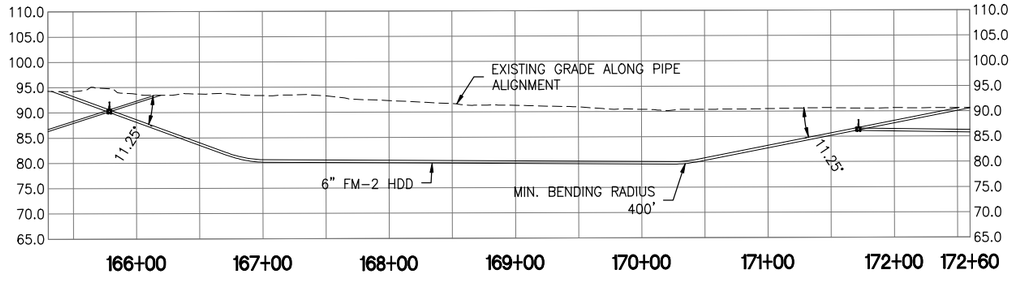
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FM HDD PROFILE 3
C3

GRAPHIC SCALE
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SCALE IN FEET
1" = 10' V

GRAPHIC SCALE
0 30 60 120
SCALE IN FEET
1" = 60' H



FM HDD PROFILE 4
C4

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

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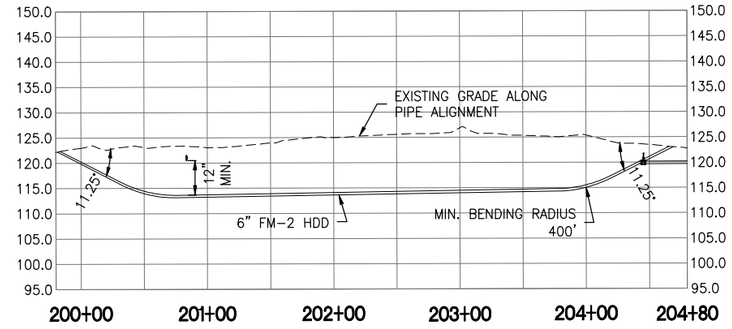
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INDEX NO:
DWG NO: C12

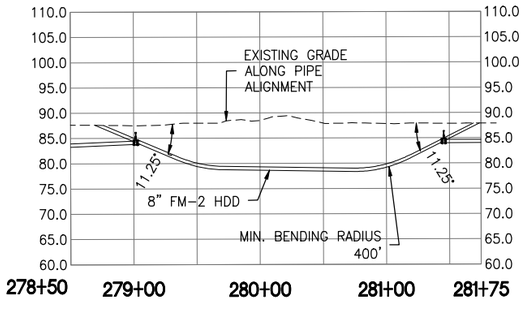
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FM HDD PROFILE 5 (C5)



FM HDD PROFILE 6 (C8)

GRAPHIC SCALE
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SCALE IN FEET
1" = 10' V

GRAPHIC SCALE
0 30 60 120
SCALE IN FEET
1" = 60' H

BID DOCUMENTS

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

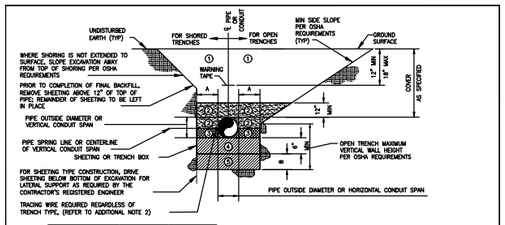
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PROJECT NO: 26110-053-01
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INDEX NO:
DWG NO: C13

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NOMINAL PIPE DIAMETER OR HORIZONTAL CONDUIT SPAN (INCHES)	MINIMUM SIDEWALL CLEARANCE A (INCHES)	ADDITIONAL EXCAVATION DEPTH (1) B (INCHES)
LESS THAN 24	12	12
24 AND GREATER	18	18

(1) REQUIRED WHERE UNSUITABLE MATERIAL IS ENCOUNTERED.

ZONE NO.	ZONE NAME	MATERIAL	COMPACTION
1	FINAL BACKFILL	AS SPECIFIED	21" LEVEL SIDE MODIFIED PROCTOR MAXIMUM DRY DENSITY ASTM D-1557 (USER WHEN UNDER PAVEMENT)
2	INITIAL BACKFILL		
3	HAUNCHING		
4	BEDDING		
5	FOUNDATION		

TRENCH ZONE NOTES:

(1) FINAL BACKFILL SHALL BE INSTALLED IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. REFER TO ADDITIONAL NOTE 3.

(2) INITIAL BACKFILL SHALL BE INSTALLED IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HAND TAMPING OR AN APPROVED METHOD OF MECHANICAL TAMPING. REFER TO ADDITIONAL NOTE 3.

(3) HAUNCHING SHALL BE IN COMPLETELY DEWATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HAND TAMPING. HAUNCHING SHALL BE BROUGHT UP EQUALLY ON BOTH SIDES OF THE PIPE.

(4) BEDDING SHALL BE INSTALLED IN COMPLETELY DEWATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT, AND SHALL BE COMPACTED BY HAND OR MECHANICAL TAMPING. PROPERLY SHAPED BELL HOLES SHALL BE EXCAVATED IN THE BEDDING TO PERMIT ASSEMBLY OF THE PIPE. REFER TO ADDITIONAL NOTE 3.

(5) NATIVE, UNDISTURBED MATERIAL IN COMPLETELY DEWATERED TRENCHES MEETING THE COMPACTION AND MATERIAL REQUIREMENTS FOR COMPACTED BEDDING MATERIAL NEED NOT BE REPLACED OR REMOVED, EXCEPT FOR SHAPING OF THE BELL HOLES, AND WHERE REFILL IS REQUIRED.

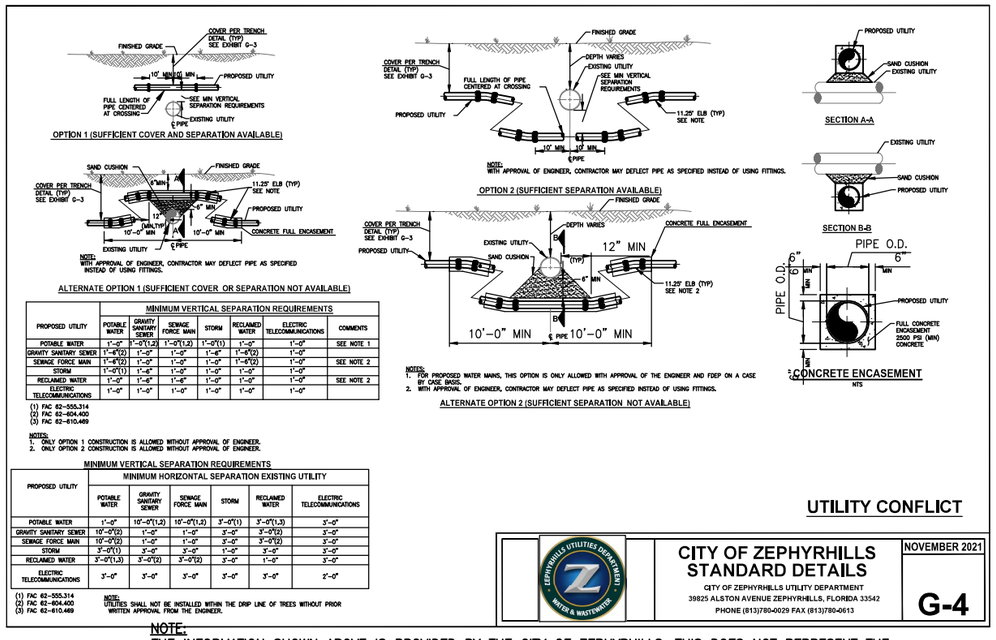
FOUNDATION SHALL BE REQUIRED WHERE UNSUITABLE MATERIAL IS ENCOUNTERED. FOUNDATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS FOR BEDDING. REFER TO ADDITIONAL NOTE 3.

ADDITIONAL NOTES:

1. FOR TRENCHES IN VEHICULAR TRAFFIC AREAS OR BENEATH SURFACE IMPROVEMENTS (EG, SLABS, ASPHALT, ETC.) SEE CONTRACT SPECIFICATIONS FOR ADDITIONAL COMPACTION REQUIREMENTS. SEE DRAWINGS FOR SURFACE IMPROVEMENT AND /OR RESTORATION DETAILS WHERE APPLICABLE.
2. TRACING WIRE SHALL BE INSTALLED ON THE SIDE OF THE PIPE AND ATTACHED TO THE PIPE EVERY 10' W/ A NYLON WIRE TIE. IF THE WIRE IS DAMAGED OR NEEDS TO BE EXTENDED A 3M WATERPROOF TYPE UF SPLICE SHALL BE INSTALLED TO REPAIR THE WIRE. THE ENDS OF THE TRACING WIRE SHALL BE BROUGHT UP IN EVERY VALVE BOX ON THE LINE AND AT THE HYDRANT VALVES. THERE SHALL BE A MINIMUM COIL OF 3' LEFT UNDER THE VALVE BOX COVER. THE WIRE SHALL BE TESTED TO VERIFY CONDUCTIVITY.
3. ALTERNATIVE LIFT THICKNESSES, NOT EXCEEDING 12 INCHES LOOSE MEASUREMENT, ARE ACCEPTABLE IN TRENCH ZONES 1, 2, 4, AND 5 PROVIDED 1) THE LIFT THICKNESS DOES NOT EXCEED THE MAXIMUM VALUE RECOMMENDED IN WRITING BY THE APPLICABLE PIPE MANUFACTURER AND 2) FIELD TEST RESULTS CONFIRM THAT THE SPECIFIED COMPACTION REQUIREMENTS ARE BEING MET.

TYPICAL UTILITY TRENCH DETAIL
NTS

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613
NOVEMBER 2021
G-3



PROPOSED UTILITY	MINIMUM VERTICAL SEPARATION REQUIREMENTS: POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS	COMMENTS
POTABLE WATER	1'-0"	1'-0"(1,2)	1'-0"(1,2)	1'-0"(1)	1'-0"	1'-0"	SEE NOTE 1
GRAVITY SANITARY SEWER	1'-0"(2)	1'-0"	1'-0"	1'-0"	1'-0"(2)	1'-0"	
SEWAGE FORCE MAIN	1'-0"(2)	1'-0"	1'-0"	1'-0"	1'-0"(2)	1'-0"	SEE NOTE 2
STORM	1'-0"(1)	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	
RECLAIMED WATER	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	SEE NOTE 2
ELECTRIC TELECOMMUNICATIONS	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	

(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

NOTES:
1. ONLY OPTION 1 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.
2. ONLY OPTION 2 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.

MINIMUM VERTICAL SEPARATION REQUIREMENTS

PROPOSED UTILITY	MINIMUM HORIZONTAL SEPARATION EXISTING UTILITY: POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS
POTABLE WATER	1'-0"	10'-0"(1,2)	10'-0"(1,2)	3'-0"(1)	3'-0"(1,3)	3'-0"
GRAVITY SANITARY SEWER	10'-0"(2)	1'-0"	1'-0"	3'-0"	3'-0"(2)	3'-0"
SEWAGE FORCE MAIN	10'-0"(2)	1'-0"	1'-0"	3'-0"	3'-0"(2)	3'-0"
STORM	3'-0"(1)	3'-0"	3'-0"	1'-0"	3'-0"	3'-0"
RECLAIMED WATER	3'-0"(1,3)	3'-0"(2)	3'-0"(2)	3'-0"	1'-0"	3'-0"
ELECTRIC TELECOMMUNICATIONS	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	2'-0"

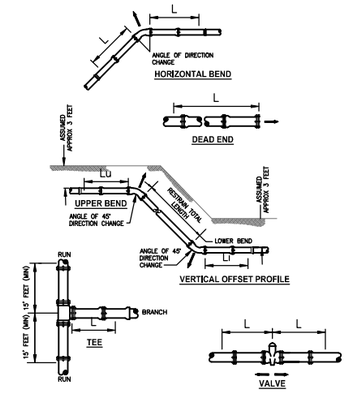
(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

NOTE: UTILITIES SHALL NOT BE INSTALLED WITHIN THE DRIP LINE OF TREES WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.

UTILITY CONFLICT

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613
NOVEMBER 2021
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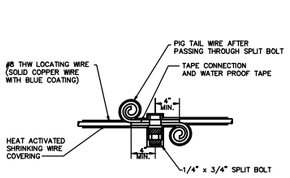
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NOMINAL SIZE	VALVES OR DEAD-ENDS	HORIZONTAL BENDS: 90° BENDS	45° BENDS	22.5° BENDS	11.25° BENDS	VERTICAL OFFSET: Lu	Ll	TEES: RUN SIZE	BRANCH SIZE	L (FT)	REDUCERS: RUN SIZE	L (FT)
10	84	37	16	85	4	35	16	10	≤10	27	12 TO 10	29
12	99	43	18	9	5	41	18	12	≤12	41		

NOTES:
1. THE SCHEDULE SHOWN IS FOR THE FOLLOWING SERVICE CONDITIONS: 150 PSIG; SPECIFIED TRENCH ZONE MATERIAL; 36 INCHES COVER; TYPE 3 LAYING CONDITIONS; AND 1.5 SAFETY FACTOR.
2. RESTRAINED LENGTHS SHOWN IN TABLE ARE IN FEET AND ARE MINIMUM LENGTHS REQUIRED IN EACH DIRECTION FROM FITTING OR VALVES.
3. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING RESTRAINED JOINTS.
4. ALL PIPE SHALL BE RESTRAINED TO THE NEXT JOINT BEYOND THE RESTRAINED LENGTH GIVEN.
5. EACH SIDE OF HDPE TRANSITION FITTINGS SHALL BE RESTRAINED PER THE RESTRAINED JOINT SCHEDULE AS AN IN-LINE VALVE.

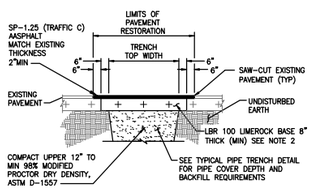
TYPICAL RESTRAINED JOINT DETAIL
NTS



NOTES:
1. THE ENDS OF ALL LOCATING WIRES, WHETHER THEY ARE SPLICED, CONNECTED, OR TERMINATED, SHALL HAVE THE LAST THREE INCHES PIG TAILED AS DETAILED HEREON.
2. AFTER INSTALLATION OF THE LOCATING WIRE THE SYSTEM SHALL BE SUBJECTED TO TESTING, IN THE PRESENCE OF CITY UTILITIES STAFF PRIOR TO BACKFILL, IN ORDER TO THAT THE SYSTEM IS FUNCTIONAL.

LOCATING WIRE SPLICING
NOT TO SCALE

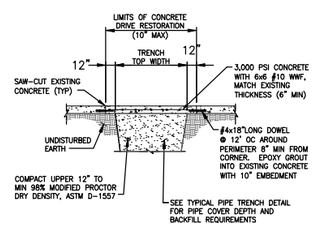
CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613
NOVEMBER 2021
G-8



NOTES:
1. ASPHALT PAVEMENT RESTORATION DETAIL APPLIES TO CITY ROADS, DRIVEWAYS, PRIVATE ROADS, DRIVES, MISCELLANEOUS PATCHES, AND SIMILAR RESTORATION.
2. NEW LIMEROCK TO BE COMPACTED TO NOT LESS THAN 98% MODIFIED PROCTOR DRY DENSITY, ASTMD-1557.
3. FOR COUNTY ROADS AND STATE ROADS, DESIGN SHALL BE IN COMPLIANCE WITH PASCO COUNTY STANDARDS AND FDOT STANDARDS RESPECTFULLY.

ASPHALT PAVEMENT RESTORATION
NTS

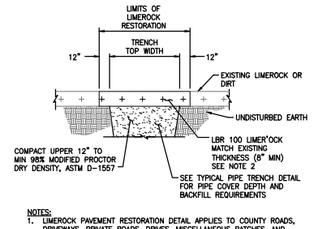
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G-9



NOTES:
MATCH EXISTING GRADE AND FINISH.

CONCRETE DRIVE RESTORATION
NTS

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NOVEMBER 2021
G-9A



NOTES:
1. LIMEROCK PAVEMENT RESTORATION DETAIL APPLIES TO COUNTY ROADS, DRIVEWAYS, PRIVATE ROADS, DRIVES, MISCELLANEOUS PATCHES, AND SIMILAR RESTORATION.
2. NEW LIMEROCK TO BE COMPACTED TO NOT LESS THAN 98% MODIFIED PROCTOR DRY DENSITY, ASTMD-1557.

LIMEROCK RESTORATION
NTS

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PHONE (813)780-0029 FAX (813)780-0613
NOVEMBER 2021
G-9B

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

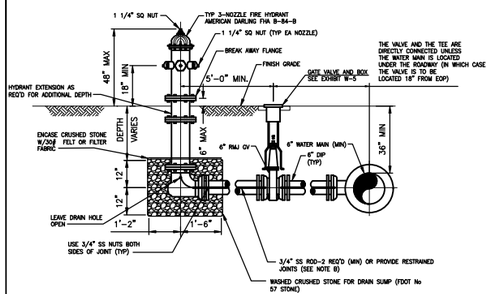
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PROJECT NO: 26110-053-01
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INDEX NO:
DWG NO: C14

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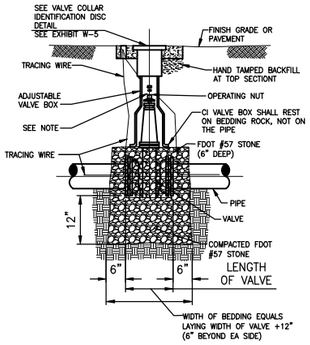
© Jones Edmunds 2234



NOTES:
A. FIRE HYDRANT INSTALLATION SHALL BE IN ACCORDANCE WITH THE CITY'S LAND DEVELOPMENT CODE.
B. 3/4" STAINLESS STEEL ROD CUT AND THREADED AS REQUIRED, OR PROVIDE RESTRAINED JOINTS.
C. FIRE HYDRANTS SHALL BE INSTALLED BETWEEN 3' AND 7' FROM EDGE OF PAVEMENT.
D. TIE RODS, NUTS, WASHERS AND OTHER FASTENERS SHALL BE GALVANIZED OR TYPE 316 STAINLESS STEEL.
E. 4 1/2" PUMPER NOZZLE TO BE PERPENDICULAR TO CENTERLINE OF MAJOR STREET.
F. FIRE HYDRANT ASSEMBLY INCLUDES ALL THAT IS SHOWN INCLUDING DI PIPE TO R/W, DIP TEE AT MAIN, HYDRANT, REDUCERS, VALVE, HYDRANT EXTENSIONS, VALVE EXTENSIONS, ALL PIPING AND MISCELLANEOUS APPURTENANCES REQUIRED FOR A COMPLETE INSTALLATION.
G. FOR FIRE HYDRANTS ALONG PAVED ROADWAYS, INSTALL RAISED PAVEMENT MARKER FOR FIRE HYDRANT IDENTIFICATION. MARKER SHALL BE BLUE AND IN ACCORDANCE WITH FDOT 706. MARKER SHALL BE LOCATED IN THE CENTER OF CLOSEST LANE PERPENDICULAR TO FIRE HYDRANT.

FIRE HYDRANT DETAIL
NTS

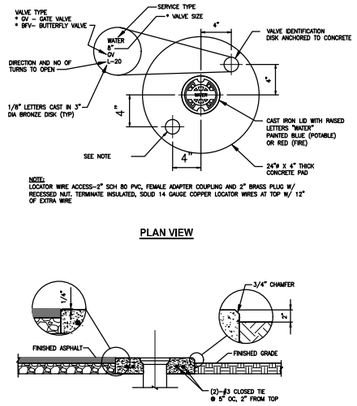
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NOVEMBER 2021
W-10



NOTES:
1. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.
2. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.

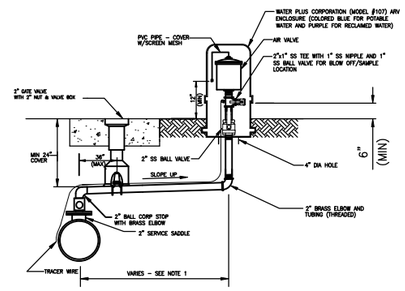
GATE VALVE BOX
NTS

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NOVEMBER 2021
W-3



VALVE COLLAR AND IDENTIFICATION DISK
NTS

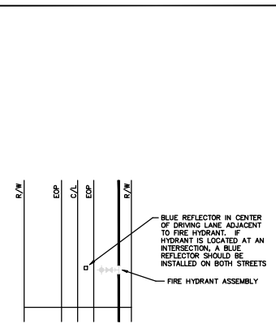
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PHONE (813)780-0029 FAX (813)780-0613
NOVEMBER 2021
W-5



NOTES:
1. OFFSET DISTANCE SHOWN ON DRAWINGS.
2. ADJUST HORIZONTAL LOCATION OF ARV ENCLOSURE, AS REQUIRED TO AVOID SIDEWALK. LOCATE ARV ENCLOSURE WITHIN 1' OF R/W OR AS OTHERWISE DETERMINED BY THE CITY.

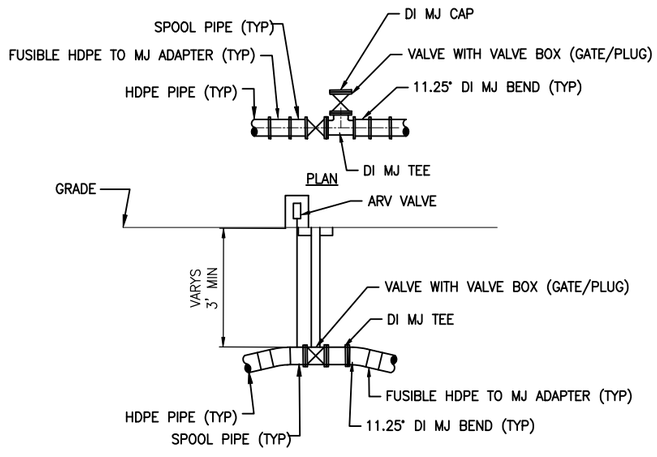
OFFSET AIR VALVE DETAIL
NTS

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CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
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NOVEMBER 2021
W-13



FIRE HYDRANT REFLECTOR DETAIL
NOT TO SCALE

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DECEMBER 2015
W-11

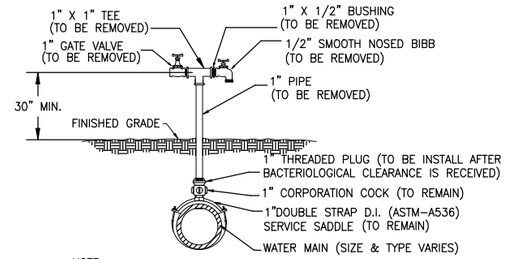


SECTION

PIPE TRANSITION DETAIL
NTS

1

NOTES:
(1) ALL CONNECTIONS SHALL BE RESTRAINED.
(2) FITTING CALLOUTS AS SHOWN IN DETAIL ARE FOR CONCEPTUAL PURPOSES. SEE PLANS FOR SPECIFIC FITTING AND PIPE CALLOUTS AT PIPE TRANSITIONS AND OTHER LOCATIONS.



NOTE:
1) LOCATION OF SAMPLE POINT BIBB SHALL NOT BE WITHIN THE ROADWAY BUT ROUTED TO THE ROADWAY SHOULDERS (NON-TRAFFIC AREAS) OF THE ROAD (WHERE APPLICABLE)
2) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL PIPING & FITTINGS NOTED AFTER BACTERIOLOGICAL CLEARANCE IS RECEIVED FROM THE HEALTH DEPARTMENT.

1" BACTERIOLOGICAL SAMPLE POINT DETAIL
N.T.S.

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BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

CIVIL DETAILS

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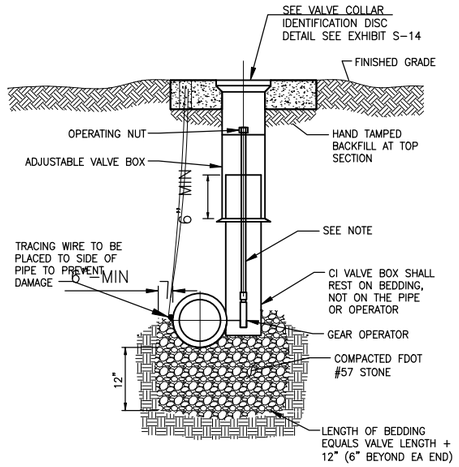
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DATE: NOV. 2023
INDEX NO:
DWG NO: C15

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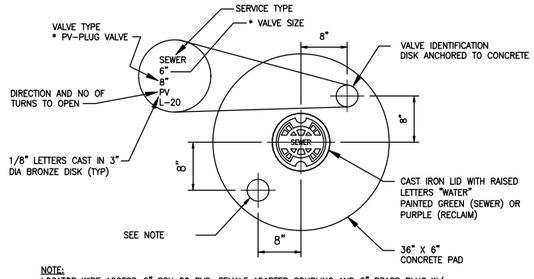
NOTES:
1. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.
2. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.

PLUG VALVE
NTS

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613

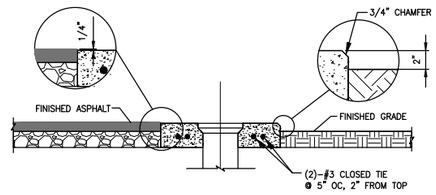
NOVEMBER 2021

S-12



NOTE:
LOCATOR WIRE ACCESS-2" SCH 80 PVC, FEMALE ADAPTER COUPLING AND 2" BRASS PLUG W/ RECESSED NUT. TERMINATE INSULATED, SOLID 14 GAUGE COPPER LOCATOR WIRES AT TOP W/ 12" OF EXTRA WIRE

PLAN VIEW



VALVE COLLAR AND IDENTIFICATION DISK
NTS

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
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NOVEMBER 2021

S-14

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

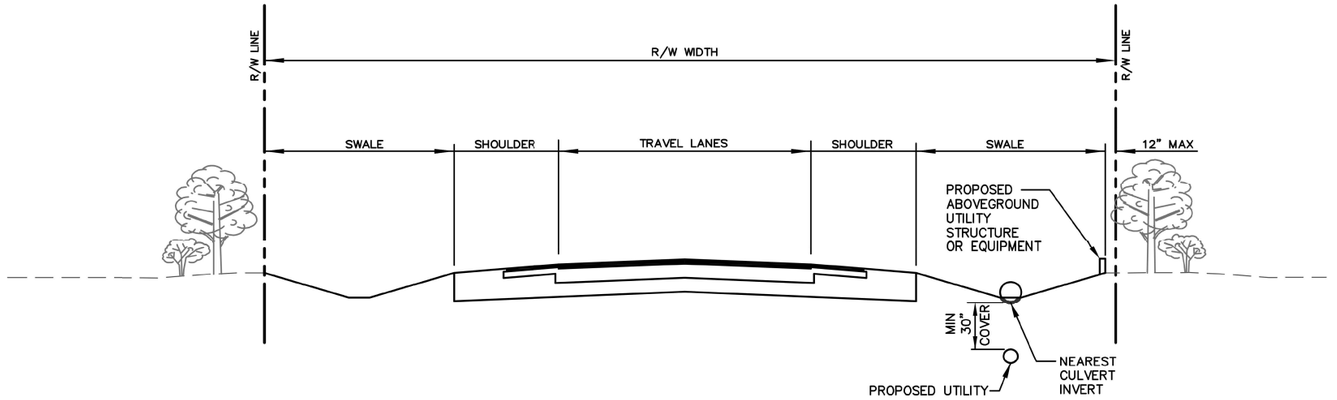
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INDEX NO:
DWG NO: C16

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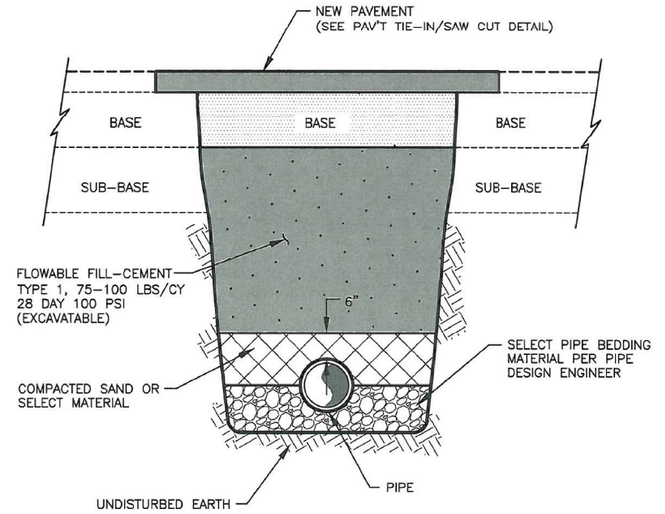


UTILITY INSTALLATION IN SWALE NEAR CULVERT
NTS

NOTE:
NO DEVIATIONS TO THIS DETAIL WILL BE PERMITTED UNLESS APPROVED BY THE COUNTY ENGINEER.
ANY PROPOSED ALTERATIONS SHALL BE CLEARLY IDENTIFIED AND HIGHLIGHTED ON DETAIL.

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PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	UTILITY INSTALLATION DETAIL RURAL ROADWAY TYPICAL SECTION	Sheet No. 1 of 1	
	APPROVED BY JCW BCC APPROVAL REVISED	Index No. 301	



TYPICAL TRENCH SECTION
NTS

NOTE:
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PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	FLOWABLE FILL	Sheet No. 1 of 1	
	APPROVED BY JCW BCC APPROVAL REVISED	Index No. 103	

05/09/08

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
MSS CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \
WATER LINE EXTENSION

CIVIL DETAILS

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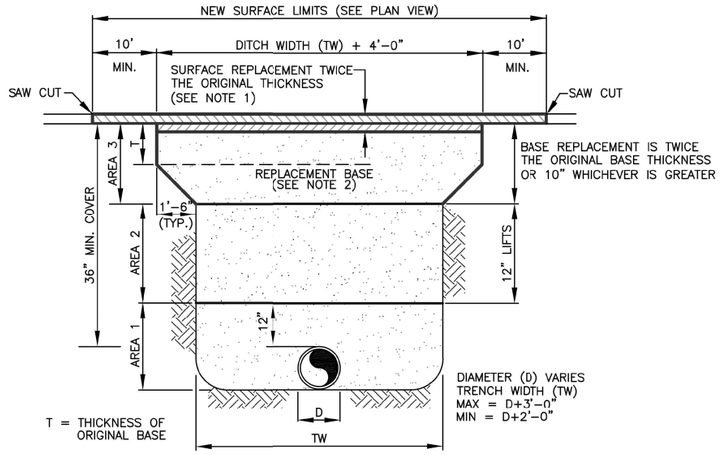
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INDEX NO:	DWG NO:
	C17

BID DOCUMENTS

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PLOTTED: 11/8/2023 11:26:09 AM KEYLA VIRGILIO, EI

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NOTES

1. REPLACEMENT ASPHALT SHALL BE TWICE THE ORIGINAL PAVEMENT THICKNESS WITH A MINIMUM OF TWO (2) INCHES AND SHALL BE SP 12.5 OR TYPE S-3 ASPHALT, AND FC-3 IF REQUIRED.
2. REPLACEMENT BASE SHALL BE NEW MATERIAL NOT REUSED FROM EXCAVATION. ACCEPTABLE BASE ALTERNATIVE SHALL BE TYPE ABC OR BETTER ASPHALT PLACED AT A TOTAL THICKNESS OF SIX (6) INCHES.
3. AREA 1 – BACKFILL SHALL BE PLACED IN SIX (6) INCH LIFT WITH EACH LIFT COMPACTED TO **98% OF ASTM FM5-521** USING MECHANICAL TAMPERS.
4. AREA 2 – BACKFILL SHALL BE PLACED IN TWELVE (12) INCH LIFTS WITH EACH LIFT COMPACTED TO **98% OF FM5-521** USING APPROPRIATE COMPACTING EQUIPMENT.
5. AREA 3 – LIMEROCK (LBR 100) BASE SHALL BE CONSTRUCTED IN LIFTS NOT GREATER THAN SIX (6) INCHES COMPACTED THICKNESS, AND HAVE A DENSITY EQUAL TO **98% OF FM5-521**.
6. FLOWABLE FILL MAY BE PLACED ABOVE AREA 1 UP TO THE BOTTOM OF THE RESTORED BASE. MIX DESIGN SHALL CONFORM TO FDOT STANDARD SPECIFICATIONS SECTION 121. IF FLOWABLE FILL IS USED FOR TRENCH BACKFILL, THE AMOUNT OF COVER ABOVE TOP OF PIPE TO AREA 2 MAY BE REDUCED TO 6 INCHES.

Tests shall be submitted to Pasco County Engineering Inspections verifying open cut restoration is per general notes before release of permit or gurantee, if applicable. Material and thickness verification shall be required. All testing shall be Pasco County Services Department Testing Specificatiions for Construction of Roads, Storm Drainage and Utilities; October 2006.

NOTE:
NO DEVIATIONS TO THIS DETAIL WILL BE PERMITTED UNLESS APPROVED BY THE COUNTY ENGINEER.
ANY PROPOSED ALTERATIONS SHALL BE CLEARLY IDENTIFIED AND HIGHLIGHTED ON DETAIL.

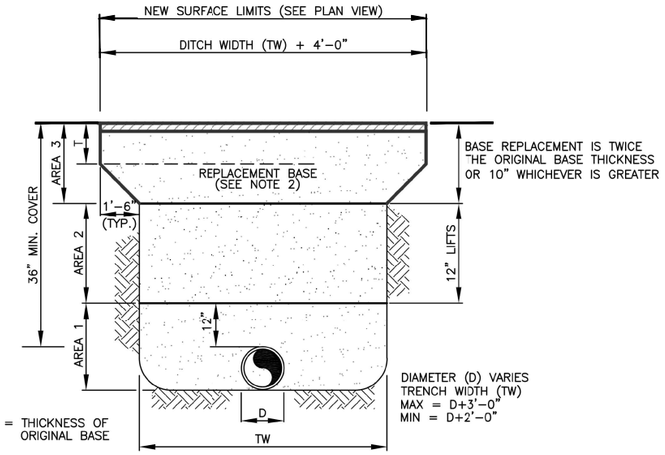
PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	OPEN CUT RESTORATION	Sheet No. 1 of 1
	APPROVED BY MICHAEL J. GARRETT, P.E. BCC APPROVAL REVISED	Index No. 102

FAYCAD Support\Details\PROJECT MANAGEMENT STANDARD DETAILS\102_openCut-restore.dwg 09/09/08

TYPICAL ASPHALT PAVEMENT RESTORATION DETAIL 1

NTS

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4. AREA 2 – BACKFILL SHALL BE PLACED IN TWELVE (12) INCH LIFTS WITH EACH LIFT COMPACTED TO **98% OF FM5-521** USING APPROPRIATE COMPACTING EQUIPMENT.
5. AREA 3 – LIMEROCK (LBR 100) BASE SHALL BE CONSTRUCTED IN LIFTS NOT GREATER THAN SIX (6) INCHES COMPACTED THICKNESS, AND HAVE A DENSITY EQUAL TO **98% OF FM5-521**.
6. FLOWABLE FILL MAY BE PLACED ABOVE AREA 1 UP TO THE BOTTOM OF THE RESTORED BASE. MIX DESIGN SHALL CONFORM TO FDOT STANDARD SPECIFICATIONS SECTION 121. IF FLOWABLE FILL IS USED FOR TRENCH BACKFILL, THE AMOUNT OF COVER ABOVE TOP OF PIPE TO AREA 2 MAY BE REDUCED TO 6 INCHES.

Tests shall be submitted to Pasco County Engineering Inspections verifying open cut restoration is per general notes before release of permit or gurantee, if applicable. Material and thickness verification shall be required. All testing shall be Pasco County Services Department Testing Specificatiions for Construction of Roads, Storm Drainage and Utilities; October 2006.

NOTE:
NO DEVIATIONS TO THIS DETAIL WILL BE PERMITTED UNLESS APPROVED BY THE COUNTY ENGINEER.
ANY PROPOSED ALTERATIONS SHALL BE CLEARLY IDENTIFIED AND HIGHLIGHTED ON DETAIL.

PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	OPEN CUT RESTORATION	Sheet No. 1 of 1
	APPROVED BY MICHAEL J. GARRETT, P.E. BCC APPROVAL REVISED	Index No. 102

FAYCAD Support\Details\PROJECT MANAGEMENT STANDARD DETAILS\102_openCut-restore.dwg 09/09/08

TYPICAL LIMEROCK RESTORATION DETAIL 2

NTS

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

CIVIL DETAILS

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH A. FRASER, PE #57452 ON THE DATE SHOWN ON THE COVER SHEET.

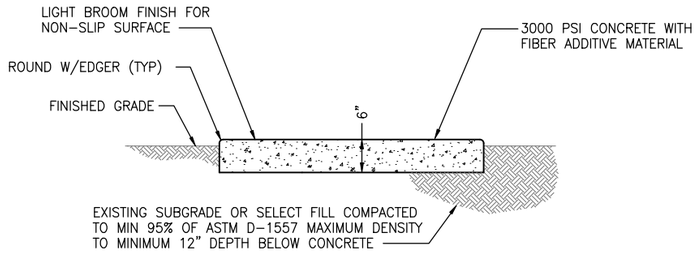
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PROJECT NO:	DATE:
26110-053-01	NOV. 2023
INDEX NO:	DWG NO: C18

SAVED: 9/29/2023 3:30 PM KFRASER Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\053-01 NORTH SIDE LS PHASE 3\DESIGN&CONSTRUCTION\CAD\DWGS\CIVIL\26110053301-C17.DWG

PLOTTED: 11/8/2023 11:26:33 AM KEYLA VIRGILIO, EI

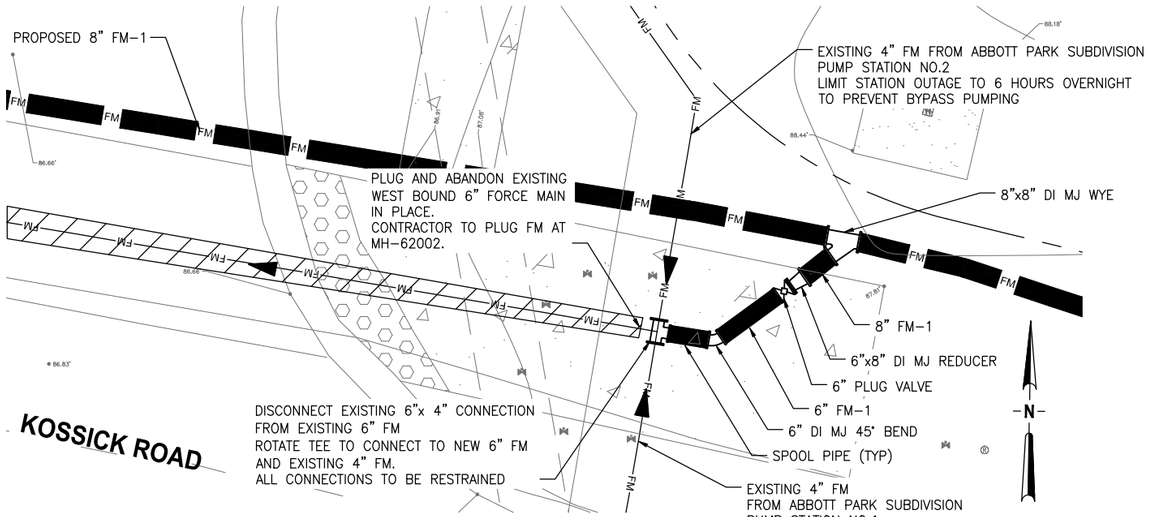
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NOTE:
SIDEWALK JOINTS SHALL BE PER FDOT INDEX 310.

CONCRETE RAMP AND SIDEWALK DETAIL 3

NTS



EXISITNG 6" FM CONNECTION 4

NTS

C8

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

CIVIL DETAILS

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PROJECT NO:	DATE:
26110-053-01	NOV. 2023
INDEX NO:	DWG NO: C19

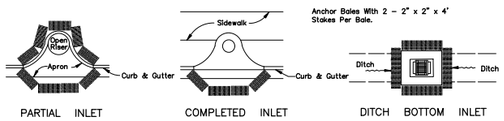
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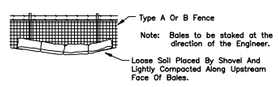
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EROSION AND SEDIMENT CONTROL NOTES

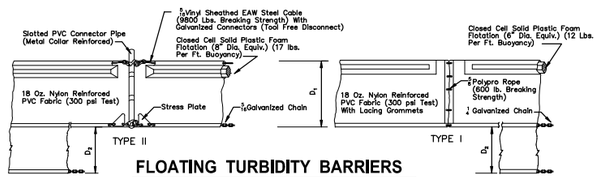
1. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING SILT FROM SITE IF NOT REUSABLE ON-SITE AND ASSURING PLAN ALIGNMENT AND GRADE IN ALL DITCHES AND SWALES AT COMPLETION OF CONSTRUCTION.
2. THE SITE CONTRACTOR IS RESPONSIBLE FOR REMOVING THE TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES AFTER COMPLETION OF CONSTRUCTION AND ONLY WHEN AREAS HAVE BEEN STABILIZED.
3. ADDITIONAL PROTECTION – ON-SITE PROTECTION IN ADDITION TO THE ABOVE MUST BE PROVIDED THAT WILL NOT PERMIT SILT TO LEAVE THE PROJECT CONFINES DUE TO UNSEEN CONDITIONS OR ACCIDENTS.
4. CONTRACTOR SHALL INSURE THAT ALL DRAINAGE STRUCTURES, PIPES, ETC. ARE CLEANED OUT AND WORKING PROPERLY AT TIME OF ACCEPTANCE.
5. WIRE MESH SHALL BE LAID OVER THE DROP INLET SO THAT THE WIRE EXTENDS A MINIMUM OF 1 FOOT BEYOND EACH SIDE OF THE INLET STRUCTURE. HARDWARE CLOTH OR COMPARABLE WIRE MESH WITH 1/2-INCH OPENINGS SHALL BE USED. IF MORE THAN ONE STRIP OF MESH IS NECESSARY, THE STRIPS SHALL BE OVERLAPPED.
6. FDOT NO. 1 COARSE AGGREGATE SHALL BE PLACED OVER THE WIRE MESH AS INDICATED IN D-903. THE DEPTH OF STONE SHALL BE AT LEAST 12 INCHES OVER THE ENTIRE INLET OPENING. THE STONE SHALL EXTEND BEYOND THE INLET OPENING AT LEAST 18 INCHES ON ALL SIDES.
7. IF THE STONE FILTER BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER ADEQUATELY PERFORMS ITS FUNCTION, THE STONES MUST BE PULLED AWAY FROM THE INLET, CLEANED AND REPLACED.
8. BALES SHALL BE EITHER WIRE-BOUND OR STRING-TIED WITH THE BINDINGS ORIENTED AROUND THE SIDES RATHER THAN OVER AND UNDER THE BALES.
9. BALES SHALL BE PLACED LENGTHWISE IN A SINGLE ROW SURROUNDING THE INLET, WITH THE ENDS OF ADJACENT BALES PRESSED TOGETHER.
10. THE FILTER BARRIER SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED TO A MINIMUM DEPTH OF 8 INCHES. AFTER THE BALES ARE STAKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AND COMPACTED AGAINST THE FILTER BARRIER.
11. EACH BALE SHALL BE SECURELY ANCHORED AND HELD IN PLACE BY AT LEAST TWO STAKES OR REBARS DRIVEN THROUGH THE BALE.
12. LOOSE STRAW SHOULD BE WEDGED BETWEEN BALES TO PREVENT WATER FROM ENTERING BETWEEN BALES.
13. STRAW BALE BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
14. CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED BALES, END RUNS AND UNDERCUTTING BENEATH BALES.
15. NECESSARY REPAIRS TO BARRIERS OR REPLACEMENT OF BALES SHALL BE ACCOMPLISHED PROMPTLY.
16. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE STRAW BALE BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.
17. SILT FENCES AND FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
18. SHOULD THE FABRIC ON A SILT FENCE OR FILTER BARRIER DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
19. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-THIRD THE HEIGHT OF THE BARRIER.
20. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.
21. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
22. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
23. THE CONTRACTOR IS RESPONSIBLE FOR FOLLOWING THE BEST EROSION AND SEDIMENT CONTROL PRACTICES AS OUTLINED IN THE PLANS, SPECIFICATIONS AND ST. JOHNS RIVER WATER MANAGEMENT DISTRICT SPECIFICATIONS AND CRITERIA.
24. FOR ADDITIONAL INFORMATION ON SEDIMENT AND EROSION CONTROL REFER TO "THE FLORIDA DEVELOPMENT MANUAL – A GUIDE TO SOUND LAND AND WATER MANAGEMENT" FROM THE STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION (F.D.E.R.) CHAPTER 6.
25. EROSION AND SEDIMENT CONTROL BARRIERS SHALL BE PLACED ADJACENT TO ALL WETLAND AREAS WHERE THERE IS POTENTIAL FOR DOWNSTREAM WATER QUALITY DEGRADATION. SEE DETAIL SHEET FOR TYPICAL CONSTRUCTION.
26. ALL DISTURBED AREAS SHALL BE GRASSED, FERTILIZED, MULCHED AND MAINTAINED UNTIL A PERMANENT VEGETATIVE COVER IS ESTABLISHED.
27. SOD SHALL BE PLACED IN AREAS WHICH MAY REQUIRE IMMEDIATE EROSION PROTECTION TO ENSURE WATER QUALITY STANDARDS ARE MAINTAINED.
28. ANY DISCHARGE FROM DEWATERING ACTIVITY SHALL BE FILTERED AND CONVEYED TO THE OUTFALL IN A MANNER WHICH PREVENTS EROSION AND TRANSPORTATION OF SUSPENDED SOLIDS TO THE RECEIVING OUTFALL.
29. DEWATERING PUMPS SHALL NOT EXCEED THE CAPACITY OF THAT WHICH REQUIRES A CONSUMPTIVE USE PERMIT FROM THE ST. JOHNS RIVER WATER MANAGEMENT DISTRICT.
30. ALL DISTURBED AREAS TO BE STABILIZED THROUGH COMPACTION, SILT SCREENS, HAY BALES, AND GRASSING. ALL FILL SLOPES 3:1 OR STEEPER TO RECEIVE STAKED SOLID SOD.
31. ALL DEWATERING, EROSION, AND SEDIMENT CONTROL TO REMAIN IN PLACE AFTER COMPLETION OF CONSTRUCTION AND REMOVED ONLY WHEN AREAS HAVE STABILIZED.
32. THIS PLAN INDICATES THE MINIMUM EROSION AND SEDIMENT MEASURES REQUIRED FOR THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR MEETING ALL APPLICABLE RULES, REGULATIONS AND WATER QUALITY GUIDELINES AND MAY NEED TO INSTALL ADDITIONAL CONTROLS.
33. THE CONTRACTOR SHALL BE REQUIRED TO RESPOND TO ALL WATER MANAGEMENT DISTRICT INQUIRIES, RELATIVE TO COMPLIANCE OF SJRWMD FOR EROSION AND SEDIMENTATION CONTROL. THE COST OF THIS COMPLIANCE SHALL BE PART OF THE CONTRACT.



PROTECTION AROUND INLETS OR SIMILAR STRUCTURES

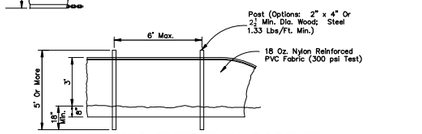


BALES BACKED BY FENCE

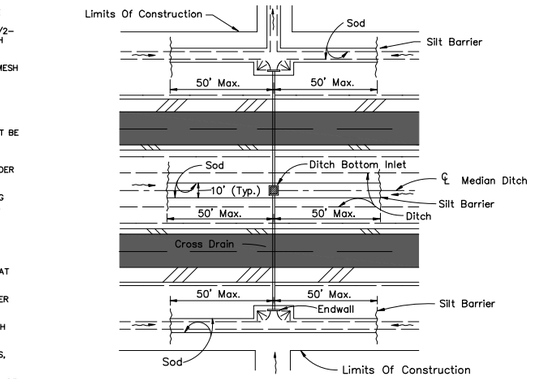


FLOATING TURBIDITY BARRIERS

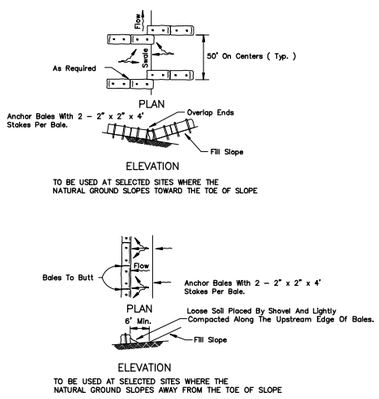
NOTICE:
COMPONENTS OF TYPES I & TYPE II MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES I AND II SHALL BE AS APPROVED BY THE ENGINEER.



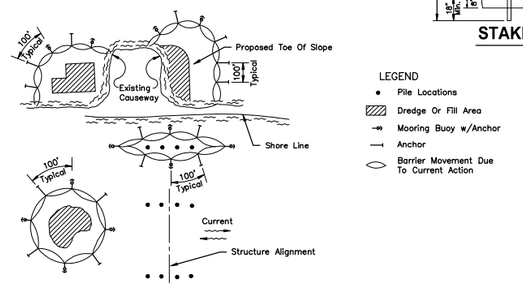
STAKED TURBIDITY BARRIER



DITCH INSTALLATIONS AT DRAINAGE STRUCTURES

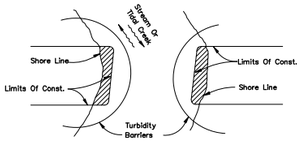


BARRIERS FOR FILL SLOPES



NOTES:
1. Turbidity barriers are to be used in all permanent bodies of water regardless of water depth.
2. Number and spacing of anchors dependent on current velocities.
3. Deployment of barrier around pile locations may vary to accommodate construction operations.
4. Navigation may require segmenting barrier during construction operations.
5. For additional information see Section 104 of the FDOT Standard Specifications.

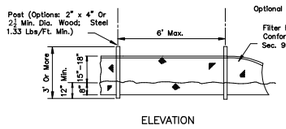
TURBIDITY BARRIER APPLICATIONS



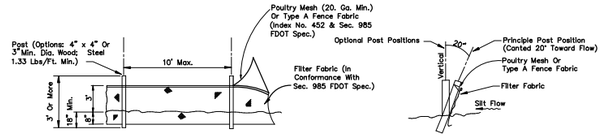
Note:
Turbidity barriers for flowing streams and tidal creeks may be either floating, or staked types or any combinations of types that will suit site conditions and meet erosion control and water quality requirements. The barrier type(s) will be at the Contractors option unless otherwise specified in the plans, however payment will be under the contract lump sum price established in the bid proposal for Erosion & Sediment Control Posts in staked turbidity barriers to be installed in vertical position unless otherwise directed by the Engineer.

TURBIDITY BARRIERS

(D-907)
N.T.S.

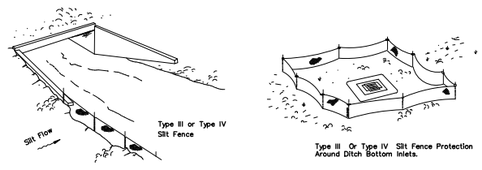


TYPE III SILT FENCE

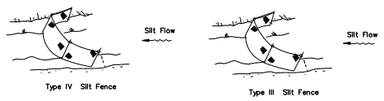


Note: Silt Fence to be paid for under the contract lump sum price for Erosion and Sediment Control.

TYPE IV SILT FENCE



Do not deploy in a manner that silt fences will act as a dam across permanent flowing watercourses. Silt fences are to be used at upland locations and turbidity barriers used at permanent bodies of water.



Note: Spacing for Type III & TYPE IV Fence to be in accordance with Chart 1, Sheet 1 of 3, FDOT Index No. 102 and ditch installations at drainage structures Sheet 2 of 3, FDOT Index No. 102.

SILT FENCE APPLICATIONS

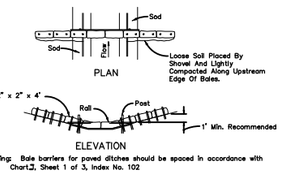
SILT FENCE TYPE III & IV

(D-908)
N.T.S.



Application and Spacing: The use of Types I & II bale barriers should be limited to the conditions outlined in Chart 1, Sheet 1 of 3, Index No. 102

BARRIER FOR UNPAVED DITCHES



Spacing: Bale barriers for paved ditches should be spaced in accordance with Chart 2, Sheet 1 of 3, Index No. 102

BARRIER FOR PAVED DITCH

NOTE:
WHERE FDOT SPECS AND INDEX ARE REFERENCED, PLEASE REFER TO FDOT ROADWAY & TRAFFIC DESIGN STANDARDS, AND FDOT STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION.

HAY BALE BARRIERS TYPE I & II

(D-912)
N.T.S.

HAY BALE LOCATION

(D-901)
N.T.S.

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED SMENARD
DRAWN SSIMS
CHECKED SMENARD

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

STORMWATER POLLUTION PREVENTION DETAILS

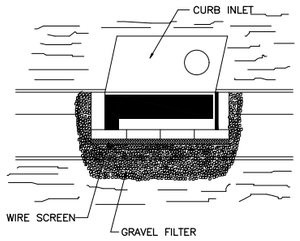
THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY THOMAS W. FRIEDRICH, PE #61281 ON THE DATE ADJACENT TO THE SEAL.

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PROJECT NO: 26110-053-01
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INDEX NO:
DWG NO: EC1

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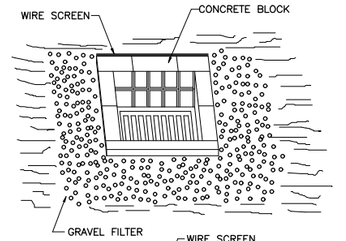


SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE AN OVERFLOW CAPABILITY IS NECESSARY TO PREVENT EXCESSIVE PONDING IN FRONT OF THE STRUCTURE.

BLOCK & GRAVEL CURB INLET SEDIMENT FILTER

(D–902)
N.T.S.



SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.

BLOCK & GRAVEL DROP INLET SEDIMENT FILTER

(D–904)
N.T.S.

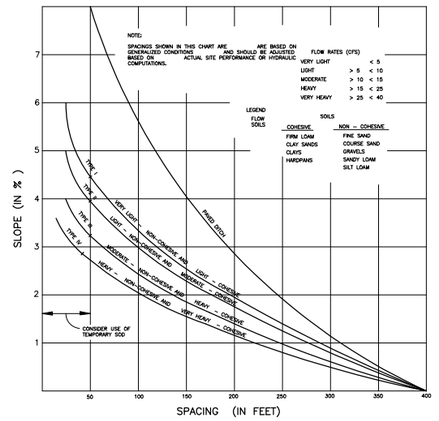
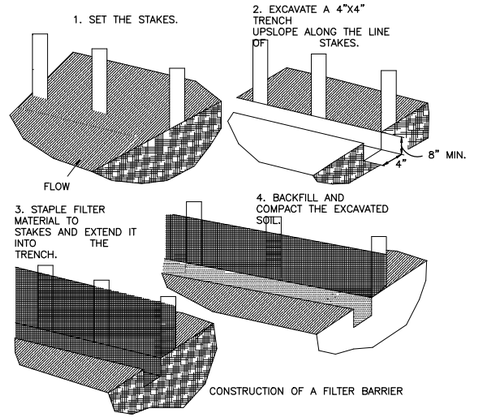


CHART I

RECOMMENDED SPACING FOR TYPE I AND TYPE II HAY BALE BARRIERS, AND TYPE III AND TYPE IV SILT FENCES AND PAVED DITCH HAY BALE BARRIERS

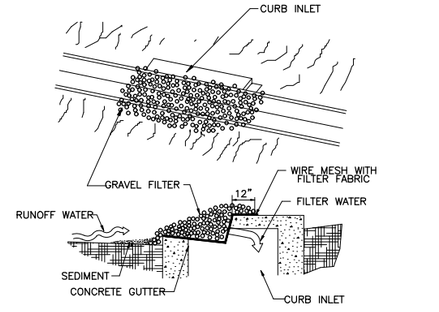
SPACING RECOMMENDATION FOR SILT FENCES & HAY BALES

(D–906)
N.T.S.



FILTER BARRIER CONSTRUCTION DETAIL

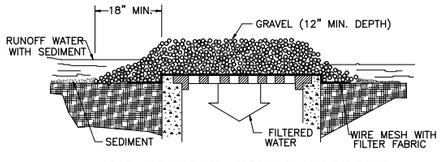
(D–910)
N.T.S.



GRAVEL CURB INLET SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE PONDING IN FRONT OF THE STRUCTURE IS NOT LIKELY TO CAUSE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.



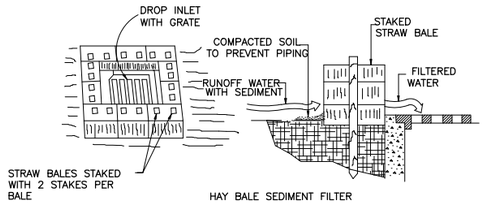
GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY CONCEN– TRATED FLOWS ARE EXPECTED, BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

GRAVEL INLET SEDIMENT TRAP

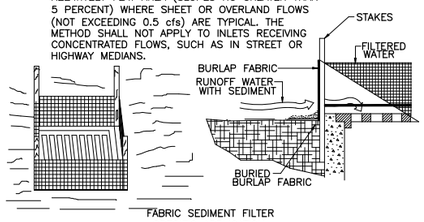
(D–903)



HAY BALE SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 cfs) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.



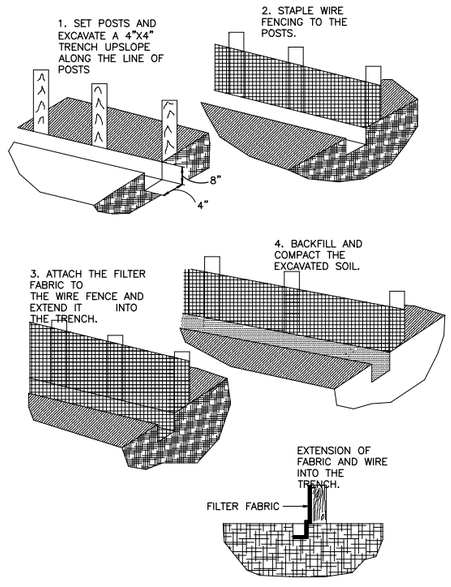
FABRIC SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 cfs) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS. SUCH AS IN STREET OR HIGHWAY MEDIANS.

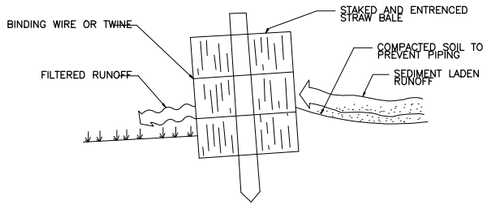
DROP INLET SEDIMENT TRAP

(D–905)



CONSTRUCTION DETAILS FOR SILT FENCES

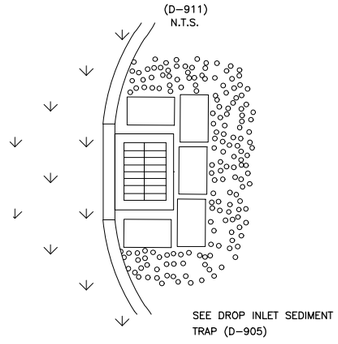
(D–909)
N.T.S.



CROSS–SECTION OF A PROPERLY INSTALLED STRAW BALE

STAKED HAY BALE

(D–911)
N.T.S.



ERECT SEDIMENT BARRIERS AT CATCH BASINS

(TYPICAL)

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED SMENARD
DRAWN SSIMS
CHECKED SMENARD

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377- 5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744- 5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

STORMWATER POLLUTION PREVENTION DETAILS

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY THOMAS W. FRIEDRICH, PE #61281 ON THE DATE ADJACENT TO THE SEAL.

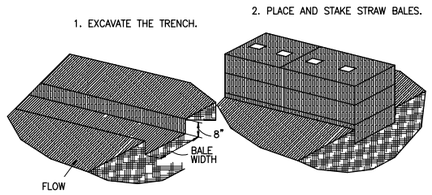
PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

PROJECT NO: 26110–053–01
DATE: NOV. 2023
INDEX NO:
DWG NO: EC2

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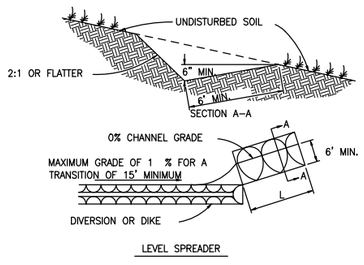
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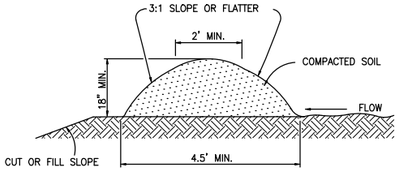
© Jones Edmunds 2234



HAY BALE BARRIER CONSTRUCTION DETAILS

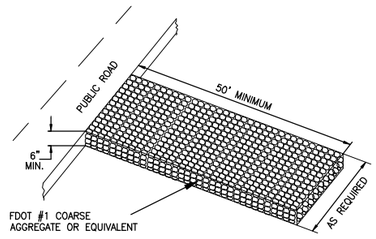
(D-913)
N.T.S.





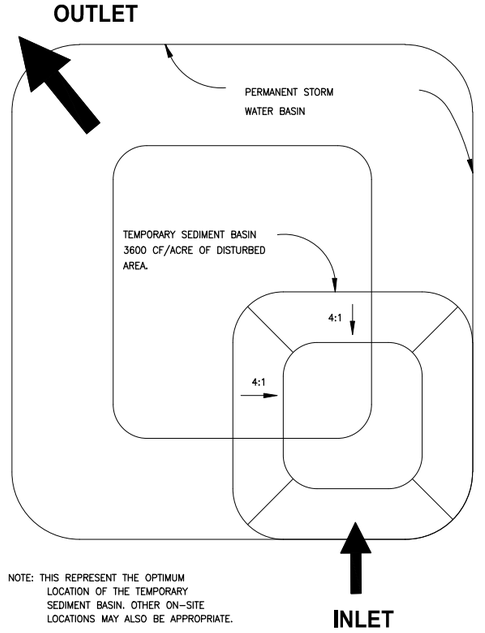
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(D-914)
N.T.S.



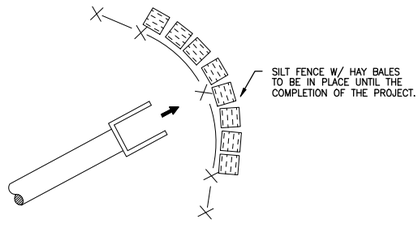
STABILIZED CONSTRUCTION ENTRANCE

N.T.S.



TEMPORARY SEDIMENT BASIN

N.T.S.



OUTLET PROTECTION

N.T.S.

BID DOCUMENTS

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED SMENARD
DRAWN SSIMS
CHECKED SMENARD

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

STORMWATER POLLUTION PREVENTION DETAILS

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY THOMAS W. FRIEDRICH, PE #61281 ON THE DATE ADJACENT TO THE SEAL.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

PROJECT NO: 26110-053-01
DATE: NOV. 2023
INDEX NO:
DWG NO: EC3

CITY OF ZEPHYRHILLS
PRE CONFERENCE AGENDA

DATE: **December 4, 2023, 10:00 a.m.**

Northside Water/Wastewater Forcemain Phase 3

1. (K) Welcome to our 2nd non-mandatory pre-conference for the discussion of the Northside Water/Wastewater Forcemain-Phase 3 project. After this meeting we will conduct a site tour of both projects South 301 Pipeline and Northside Forcemain Phase 3.

2. For those who have called in, please send me an email at kmiller@ci.zephyrhills.fl.us listing your name, company and contact information. Those who are in attendance, please make sure you have filled out our attendance sheet. The City participants of this project are:

i. Karen Miller - City's Purchasing Agent
ii. John Bostic – Utilities Director
iii. Michael Clark – Engineer – Jones Edmunds
iv. Gregg Fruecht – Engineer – Jones Edmunds For thos who have called in, please

3. (K) At this time, I will be turning this meeting over to Gregg to discuss the Northside Water/Wastewater Forcemain-Phase 3.

4. (G) Discuss project scope, plans, specifications and take any questions.

→ Also refer to Meeting Notes on the following page.

5. (K) All Questions should be sent through OPENGOV to Karen Miller, Purchasing Agent. The question will be reviewed and responded to via an Addendum. It will be posted on OPENGOV.

6. (K) **Project Timeline: Northside Water/Wastewater Forcemain-Phase 3**

Bid Time Table	Date		Time
Bid Distribution	11-20-23	Sunday	
Teleconference Pre-Bid*	12-04-23	Monday	10:00 AM
Equivalent/Question Deadline	12-29-23	Friday	10:00 AM
Response Deadline	01-12-24	Friday	10:00 AM
Presented to City Council	02-12-24	Monday	6:00 PM

7. (G/K) **Questions:**

8. Please ensure you have placed your name and company information on the sign in sheet

SITE TOUR

Scope of Work: The City of Zephyrhills is seeking a contractor to construct a force main and water mai along the north side of the City. The project will install approximately 12,500 LF of 6-inch force main along Fort King Road between Phelps Road and Simons Road; then continue east along Kossick Road and terminate near South 301/Gall Blvd. Approximately 3,900 LF of the 6-inch force main will be installed using horizontal directional drilling; the remainder will be installed using open-cut methods. The force main will connect to an existing 8-inch PVC force main along South 301/Gall Blvd.

Continuing on Kossick Road, the 8-inch force main will connect to an existing 6-inch PVC force main near Zephyr Lakes Road and continue east, crossing Wire Road, on Otis Allen Road and connect to the existing 8-inch PVC force main that runs along Otis Allen Road. Approximately 1,100 LF of the 8-inch force main will be installed using horizontal directional drilling; the remainder will be installed using open-cut methods.

The project will install approximately 4,100 LF of 12-inch PVC water main along Kossick Road between Fort King Road and Green Slope Drive. The water main will be installed using open-cut methods, no HDD is proposed. The water main will connect to an existing 12-inch PVC water main on Fort King Road and connect to an existing 12-inch PVC water main on Green Slope Drive. No new residential, commercial, or industrial services will be constructed.

This project is sized to accept future additional flows.

All design constraints will comply with the City's standard design requirements and State of Florida building requirements. Please download the package, plans, and specification for complete details.

Estimated Cost: $4.5 million

Hours of Operation: 7:00 AM – 6:00 PM, Monday – Friday,
Refer to Technical Specifications Section 1.06

Completion Time: Total estimated project time is about 15 months from Notice to Proceed
Estimated three (3) months for equipment procurement and 12 months
for construction

TelePreConference: **Monday, December 4, 2023 or Meet at City Hall-2nd Flr Conf Rm**
Link: https://meet.goto.com/159259221
Phone: 1-224-501-3412
Access Code: 159-259-221

This Teleconference will be hosted live at City Hall and via GoTo. Should you attend the meeting in person there will be a visit of the areas.

See next page for location map

Meeting Notes:

1) The Contractors were advised that the majority of this project is in a rural area with residences and the awarded Contractor should keep local residents \ owners notified when they will be working in the immediate vicinity.

2) The Contractors were reminded to only bid on items shown within the Contract Documents.

ITB 2023-02 and ITB 2023-03 South 301 Pipeline and Northside Forcemain-Ph 3

COMPANY	South 301	Northside	CONTACT	PHONE	CELL	EMAIL
Accurate Drinning Systems	x	x	Larry Roof	561-248-0230	561-248-0270	Larry@ADSPipediv.com
Accurate Drinning Systems	x	x	Chuck Emering	973-978-7859	973-978-7859	charles@Accuratedrilling.com
Castle	x	x	Henry Webre	225-240-3232	225-240-3232	bids@wearecastle.com
B&B Underground	x	x	Michael Bage	682-554-4685	682-554-4685	Michael@bbunderground.com
Benchmark Construction	x	x	Emme Waterman	863-585-3440	863-585-3440	Emmew@bmk8.com
Harbor Contracting	X	X	Anthony	Call In		
Amici Engineering	X	X	Bob Tiesler	Call In		
Kamminga & Roodvoets Inc	X	X	Clay Barnes	Call In		
DB Civil Construction	X	X	None Listed	Call In		
None Listed	x	x	Delaney Marsonek	Call In		
BRW Contracting	x	x	Dylan Northrup	Call In		
BRW Contracting	X	X	Jim Pietracatella	Call In		
Midsouth Inc	X	X	Trae Arlt	Call In		
None Listed	X	X	Charles Cerullo	Call In		

PLEASE LEAVE YOUR BUSINESS CARD

City of Zephyrhills			Karen Miller	813-780-0000 x3536	kmiller@ci.zephyrhills.fl.us
City of Zephyrhills			John Bostic		
City of Zephyrhills			OJ Kurk		
City of Zephyrhills			CJ Funnell		
Jones Edmunds			Mike Clark		
Jones Edmunds			Greg Freucht		
Jones Edmunds			Christopher Seufert		

NORTHSIDE LIFT STATION –
WATER/ WASTEWATER FORCE MAIN - PHASE 3
CITY OF ZEPHYRHILLS

City Bid No. ITB 2023-02
Jones Edmunds Project No. 26110-053-01

ADDENDUM NO. **2**

December 28, 2023

BIDS DUE: 10:00 AM, Local Time, January 12, 2024

TO ALL CONTRACTORS BIDDING ON THIS PROJECT:

The changes, additions, substitutions, and/or deletions contained in Addendum No. 3 are hereby made part of the Contract Documents fully and completely for the construction of the City of Zephyrhills Northside Lift Station, Water / Wastewater Force Main, Phase 3, Jones Edmunds & Associates, Inc., Project No. 26110-053-01, for the City of Zephyrhills, dated December 2023.

Bidders Question:

1. What are the sod quantities for this project?

1. **City / Engineer's Response:** Reimbursement for sod is incidental to bid items 5,6,7, and 8. The actual quantities is dependent on limiting the collateral damage of the existing grass and the limits of construction impacts.

Bidders Question:

2. I have a question regarding a connect to existing that is called out on the plans. The sheet number is C-10. "When the proposed FM is called out to connect to existing FM on Sheet C-10, the listed materials show an 8" DI MJ TEE. Will the connection be cut in? If so, Will we be able to have the line shut down for the required activity? If the line will not be available for a temporary shutdown, will a Tapping sleeve be authorized for use on this connection? Will bypass pumping be needed for this?"

   Please provide me with a clear and concise explanation for moving forward on this bid.

2. **City / Engineer's Response:** The City can drawdown the Wet-Well at Lift Station #50 which discharges to the existing 8" Force Main so that the proposed new Tee and Valve can be installed. It is anticipated the drawdown of LS #50 would allow 45 minutes to complete the installation. If additional time is necessary, the Contractor will need to provide a Vac truck at LS #50 to maintain the dry Wet-Well and FM until the Tee tie-in and valve is completed.

Bidders Question:

3. Please advise if all Domestic Materials are required for this project.
3. **City / Engineer's Response:** Domestic Materials, Buy America-Build America, and American Iron Steel regulations do not apply to this project.

Bidders Question:

4. SECTION 01100 SUMMARY OF WORK – B. The Work of this project includes:
   1. Installing approximately 6,000 linear feet (LF) of 6-inch sanitary sewer force main beginning at C Avenue on Gall Boulevard turning onto Tucker Road and ending west of the railroad tracks. Please clarify if the quantities on the bid form are accurate. The bid form is showing 12,978 LF of open cut and 5000 LF of HDD.
4. **City / Engineer's Response:** The above question does not pertain to this project. The bidder shall resubmit the inquiry to the correct project file.

Bidders Question:

5. Please advise if signed and sealed bore calculations are required for this project.
5. **City / Engineer's Response:** Per Specification 02740-2,1.02, I, .. the Contractor shall submit a signed and sealed bore plan before commencing any drilling activities. This is a significant quality control element due to the immediate proximity of the Lake depicted on Sheet C-1.

Bidders Question:

6. Please provide the Dollar amount for the Testing Allowance to provide consistency among Contractors and to prevent unnecessary inflated bid numbers.
6. **City / Engineer's Response:** An updated Bid Form has been posted to address this concern and is herein included in this Addendum 4.

Bidders Question:

7. Please provide the Dollar amount for the Record Drawing Allowance to provide consistency among Contractors and to prevent unnecessary inflated bid numbers.
7. **City / Engineer's Response:** An updated Bid Form has been posted to address this concern and is herein included in this Addendum 4.

Bidders Question:

8. Please advise if a field office is mandatory or is up to the discretion of the Contractor.
8. **City / Engineer's Response:** It is at the Contractor' discretion whether or not to set-up a field office.

Bidders Question:

9. Please provide the type of sod that required for this project.
9. **City / Engineer's Response:** The Contractor shall restore sodding to match the existing type of grass in place.

Bidders Question:

10. 2.07 GASKETS – Gaskets for mechanical joints shall be compatible with potable water or sewage pipe service. Please provide the type of gaskets required for the DI MJ Force Main Fittings.
10. **City / Engineer's Response:** Per Specification Section 2.11, Ductile Iron Fittings for Sewage Pipe require Buna N, Garlock Style 9122, or equal gaskets. Per Specification section 2.10 Ductile Iron fittings for Potable Water require EPDM, Viton, or Approved equal materials.

Bidders Question:

11. When the proposed FM is called out to connect to the existing FM on Sheet C-8, it states that a shutdown will be authorized overnight with a 6-hour limit. Is there a specified timeframe that has shown to have the lowest flow rates historically that should be taken into consideration when commencing the shutdown and connection?
11. **City / Engineer's Response:** Sheet C-19 Detail 4 includes the notation pertaining to the limited shut down time of local Lift Station 2 to eliminate the necessity for a Temporary By-Pass system. The Contractor shall coordinate this activity with the City. It is anticipated this work will not be conducted until after 9 pm.

Bidders Question:

12. For the existing FM that is shown running to MH-62002, the instructions state to simply abandon that line. Will this line need to be grout filled and abandoned or will it be abandoned in place with no grout? Sheet C-8 for reference.
12. **City / Engineer's Response:** Sheets C-8 and Detail Sheet C-19 have been updated and attached herein to this Addendum 2 to further clarify the area for the tie-in of the new 8 inch Force Main and the existing 6 inch Force Main to be Abandoned In Place (AIP) with grout. Similarly, the Measurement and Payment Item 5 "6 -Inch, 8-Inch Sanitary Sewer Force Main via Open-Cut" has been updated to reflect that reimbursement for the grouting activity is inclusive of Bid Item 5.

Bidders Question:

13. In reviewing the plans, we've noticed potential discrepancies in existing driveways' materials compared to the proposed open-cutting for FM and water lines. Can you advise on how to address this in our bid? Will there be a plan addendum to clarify these details for accuracy?
13. **City / Engineer's Response:** An updated Bid Form has been posted to address this concern and is herein included in this Addendum 4. Revised drawings will be posted via separate Addendum.

Bidders Question:

14. Please provide accurate separate quantities for the 6" and the 8" FM via HDD. The same way it's identified in the South 301 W Water and Wastewater project.
14. **City / Engineer's Response:** An updated Bid Form has been posted to address this concern and is herein included in this Addendum 4.

Bidders Question:

15. Please provide accurate separate quantities for the 6" and the 8" FM via Open-Cut. The same way its identified in the South 301 W Water and Wastewater project.

15. **City / Engineer's Response:** An updated Bid Form has been posted to address this concern and is herein included in this Addendum 4.

Bidders Question:

16. The air valve detail W-13 on Page C15 is for water service. Please confirm that this is the detail you want us to follow for each FM ARV. If not, please provide a detail drawing for the ARV assembly. Please state if you desire offset or vertical, and whether you want a vault or an above ground enclosure.
16. **City / Engineer's Response:** A Detail Figure of a typical Force Main ARV has been herein provided in this Addendum 2. The City requires that ARV's are typically offset above grade. to just within the Right of Way and do utilize vaults.

Bidders Question:

17. The quantities show in the schedule of values, specifically for the pipeline installation and restoration work, do not appear to match the provided plans. Will there be a revised SOV provided that accurately reflect the bid set?
17. **City / Engineer's Response:** An updated Bid Form has been posted to address this concern and is herein included in this Addendum 4. Revised drawings will be posted via separate Addendum.

City / Engineer's Response:

A) A 4' x 8' Project sign will be required to be furnished and installed by the Contractor. The City will determine the location at a later date. A template of the typical sign is included in this Addendum 2.

B) The Approved FDEP Environmental Resource Permit (ERP) is herein provided per this Addendum 2.

C. Measurement and Payment Bid Item 5 "6 -Inch, 8-Inch Sanitary Sewer Force Main via Open-Cut" has been updated per this Addendum 2 to be inclusive of any required vacuum trucks and/or pumps/pipe/fittings for the bypass pumping of sewer flow during force main connections, and grout filling of all existing piping designed to be abandoned in place.

END OF ADDENDUM

CITY OF ZEPHYRHILLS
NORTHSIDE WATER - WASTEWATER FORCE MAIN
PHASE 3

MAYOR
Melonie Bahr Monson

CITY MANAGER
William C. Poe

UTILITIES DIRECTOR
John Bostic, III

COUNCIL MEMBERS
Lance A. Smith
Kenneth M. Burgess, Jr.
Charles E. Proctor
Steven S. Spina, Jr.
Jodi Wilkenson

CONSTRUCTION COST
4,500,000.00

ESTIMATED PROJECT COMPLETION:

CONTRACTOR:

ENGINEER:
JonesEdmunds

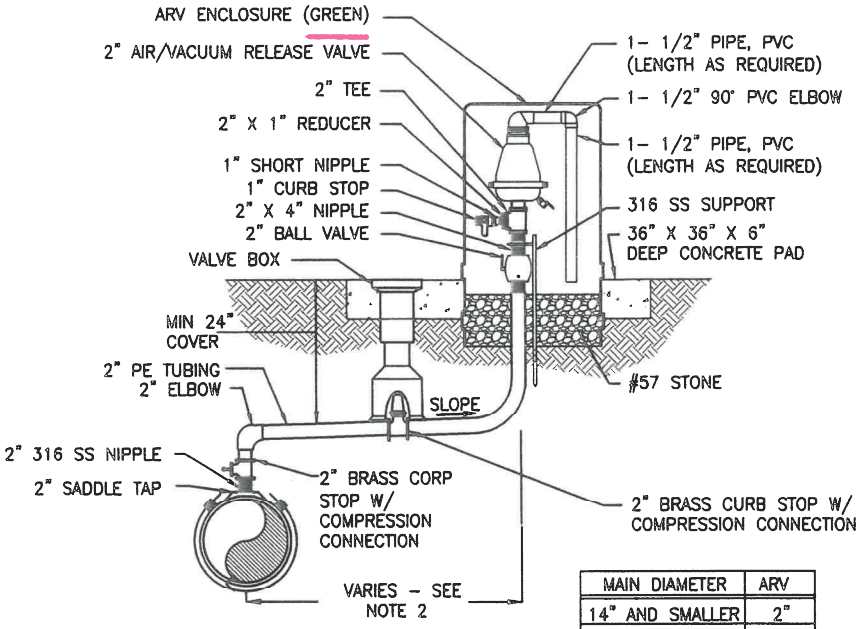
CITY OF ZEPHYRHILLS

Northside Phase 3 Force Main/Water Line Extension

CONSTRUCTION ITEMIZED PRICING SHEET

Item No.	Item Description	Qty.	Unit	Unit Price	Amount
BASE BID					
1	Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions	1	LS		
2	Traffic Control	1	LS		
3	Environmental Protection	1	LS		
4	Construction Survey and Layout	1	LS		
5	6-Inch Sanitary Sewer Force Main via Open-Cut	9,350	LF		
6	6-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	3,400	LF		
7	8-Inch Sanitary Sewer Force Main via Open-Cut	4,874	LF		
8	8-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	250	LF		
9	12-Inch Potable Water Main via Open-Cut	4,525	LF		
10	Combination Air/Vacuum Valves and Vaults	14	EA		
11	Concrete Restoration	2,150	SY		
12	Limerock Restoration	406	SY		
13	Asphalt Concrete Restoration	1,033	SY		
14	Testing Allowance	1	AL		$25,000.00
15	Record/As-Built Drawings Allowance	1	AL		$15,000.00
	TOTAL BID PRICE				

1



MAIN DIAMETER	ARV
14" AND SMALLER	2"
16" AND LARGER	3"

NOTES:
1. FOR WASTEWATER USE ONLY.
2. OFFSET DISTANCE TO BE FIELD DETERMINED AND AS CLOSE TO THE R/W LINE AS POSSIBLE.
3. ADJUST HORIZONTAL LOCATION OF SIDEWALK, AS REQUIRED TO AVOID ARV ENCLSOURE.
4. LOCATE ARV ENCLOSURE WITHIN 6" OF R/W LINE.

COMBINATION AIR/VACUUM RELEASE VALVE DETAIL

NTS

JonesEdmunds

FLORIDA DEPARTMENT OF Environmental Protection

Southwest District Office
13051 North Telecom Parkway #101
Temple Terrace, Florida 33637-0926

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

December 21, 2023

City of Zephyrhills
% John Bostic, III
5335 8th Street
Zephyrhills, Florida 33542
Jbostic@ci.zephyrhills.fl.us

File No.: 51-0441987-001-EG, Pasco County

Dear John Bostic III:

On November 7, 2023, we received your notice of intent to use a General Permit (GP), pursuant to Rule 62-330.453, Florida Administrative Code, F.A.C., to install 4,000 linear feet of 12-inch water main via open cut trenching and horizontal directional drilling under Bird Lake, a Class III Florida waterbody. The project is located on Parcel IDs: 27-25-21-0000-49900-0070, 34-25-21-0000-49900-0020, 34-25-21-0020-49900-0000, 34-25-21-0000-49900-1240, 34-25-21-0000-49900-1230, 34-25-21-0000-49900-1220, 34-25-21-0000-49900-0000, 34-25-21-0000-49900-1190, 34-25-21-0010-49900-0010, 34-25-21-0010-00100-0020, 34-25-21-0000-29900-0000, 35-25-21-0130-49900-0000, 26-25-21-0000-49900-0010, Zephyrhills, Sections 26/27/34/35, Township 25 South, Range 21 East, Pasco County.

Your intent to use a general permit has been reviewed by Department staff for three types of authorizations: (1) regulatory authorization, (2) proprietary authorization (related to state-owned submerged lands), and (3) federal authorization. The authority for review and the outcomes of the reviews are listed below. Please read each section carefully.

Your project did not qualify for federal authorization, therefore, additional authorization must be obtained prior to commencement of the proposed activity. This letter does not relieve you from the responsibility of obtaining other federal, state, or local authorizations that may be required for the activity. Please refer to the specific section(s) dealing with that portion of the review below for advice on how to proceed.

If you change the project from what you submitted, the authorization(s) granted may no longer be valid at the time of commencement of the project. Please contact us prior to beginning your project if you wish to make any changes.

1. Regulatory Review – Approved

Based on the forms, drawings, and documents revised with your notice, it appears that the project meets the requirements for the General Permit under Rule 62-330.453, F.A.C. Any activities performed under a general permit are subject to general conditions required in Rule 62-330.405, F.A.C. (attached), and the specific conditions of Rule 62-330.453, F.A.C. (attached). Any deviations from these conditions may subject the permittee to enforcement action and possible penalties.

Please be advised that the construction phase of the GP must be completed within five years from the date the notice to use the GP was received by the Department. If you wish to continue this GP beyond the expiration date, you must notify the Department at least 30 days before its expiration.

Authority for review- Part IV of Chapter 373, F.S., Title 62, F.A.C. and in accordance with the operating agreements executed between the Department and the water management districts, as referenced in Chapter 62-113, F.A.C.

2. Proprietary Review – Granted

The activity does not appear to be located on sovereign submerged lands, and does not require further authorization under Chapter 253 of the Florida Statutes, or Chapters 18-20 or 18-21 of the Florida Administrative Code.

3. Federal Review

3.1. SPGP Not Approved

Your proposed activity as outlined in your application and attached drawings **does not qualify** for Federal authorization pursuant to the State Programmatic General Permit VI-R1. **SEPARATE permit(s)** or authorization **may be required** from the U.S. Army Corps of Engineers and/or Florida Department of Environmental Protection. The activity, as proposed, does not involve discharge of dredged or fill material into the waters of the United States and therefore, **a SEPARATE PERMIT** or authorization pursuant to the State 404 Program, as described in Chapter 62-331, F.A.C. **will not be required**.

Authority for review - an agreement with the USACOE entitled "Coordination Agreement Between the U. S. Army Corps of Engineers (Jacksonville District) and the Florida Department of Environmental Protection (or Duly Authorized Designee), State Programmatic General Permit", Section 10 of the Rivers and Harbor Act of 1899, and Section 404 of the Clean Water Act.

3.2. Water Quality Certification Granted With Conditions

This permit also constitutes a *granted with conditions* water quality certification under Section 401 of the Clean Water Act, 33 U.S.C. Section 1341. Pursuant to Rule 62-330.062, F.A.C. State Water Quality Certification is granted when an activity meets all the terms and conditions of a

general permit under Rule 62-330.052, F.A.C., and the applicable Rules 62-330.401 through 62-330.635, F.A.C.

Additional Information

Please retain this general permit. The activities may be inspected by authorized state personnel in the future to ensure compliance with appropriate statutes and administrative codes. If the activities are not in compliance, you may be subject to penalties under Chapter 373, F.S., and Chapter 18-14, F.A.C.

NOTICE OF RIGHTS

This action is final and effective on the date filed with the Clerk of the Department unless a petition for an administrative hearing is timely filed under Sections 120.569 and 120.57, F.S., before the deadline for filing a petition. On the filing of a timely and sufficient petition, this action will not be final and effective until further order of the Department. Because the administrative hearing process is designed to formulate final agency action, the hearing process may result in a modification of the agency action or even denial of the application.

Petition for Administrative Hearing
A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. Pursuant to Rules 28-106.201 and 28-106.301, F.A.C., a petition for an administrative hearing must contain the following information:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name, address, any e-mail address, any facsimile number, and telephone number of the petitioner, if the petitioner is not represented by an attorney or a qualified representative; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination;

(c) A statement of when and how the petitioner received notice of the agency decision;

(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

(e) A concise statement of the ultimate facts alleged, including the specific facts that the petitioner contends warrant reversal or modification of the agency's proposed action;

(f) A statement of the specific rules or statutes that the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and

(g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wishes the agency to take with respect to the agency's proposed action.

The petition must be filed (received by the Clerk) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, or via electronic correspondence at Agency_Clerk@dep.state.fl.us. Also, a copy of the petition shall be mailed to the applicant at the address indicated above at the time of filing.

Time Period for Filing a Petition

In accordance with Rule 62-110.106(3), F.A.C., petitions for an administrative hearing by the applicant and persons entitled to written notice under Section 120.60(3), F.S., must be filed within 21 days of receipt of this written notice. Petitions filed by any persons other than the applicant, and other than those entitled to written notice under Section 120.60(3), F.S., must be filed within 21 days of publication of the notice or within 21 days of receipt of the written notice, whichever occurs first. You cannot justifiably rely on the finality of this decision unless notice of this decision and the right of substantially affected persons to challenge this decision has been duly published or otherwise provided to all persons substantially affected by the decision. While you are not required to publish notice of this action, you may elect to do so pursuant Rule 62-110.106(10)(a).

The failure to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C. If you do not publish notice of this action, this waiver will not apply to persons who have not received written notice of this action.

Extension of Time

Under Rule 62-110.106(4), F.A.C., a person whose substantial interests are affected by the Department's action may also request an extension of time to file a petition for an administrative hearing. The Department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, or via electronic correspondence at Agency_Clerk@dep.state.fl.us, before the deadline for filing a petition for an administrative hearing. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

Mediation

Mediation is not available in this proceeding.

FLAWAC Review

The applicant, or any party within the meaning of Section 373.114(1)(a) or 373.4275, F.S., may also seek appellate review of this order before the Land and Water Adjudicatory Commission under Section 373.114(1) or 373.4275, F.S. Requests for review before the Land and Water Adjudicatory Commission must be filed with the Secretary of the Commission and served on the

Department within 20 days from the date when this order is filed with the Clerk of the Department.

Judicial Review

Once this decision becomes final, any party to this action has the right to seek judicial review pursuant to Section 120.68, F.S., by filing a Notice of Appeal pursuant to Florida Rules of Appellate Procedure 9.110 and 9.190 with the Clerk of the Department in the Office of General Counsel (Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000) and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice must be filed within 30 days from the date this action is filed with the Clerk of the Department.

EXECUTION AND CLERKING

Executed in Hillsborough County, Florida.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Gerald Loesch

Gerald "J.J." Loesch
Environmental Administrator
Permitting & Waste Cleanup Program
Southwest District

Enclosures:
General Permit for Installation, Maintenance, Repair, and Removal of Utility Lines, 62-330.453, F.A.C.
General Conditions for All General Permits, Ch. 62-330.405, F.A.C.
Special Consent Conditions

Attachments:
1. Project drawings
2. Frac-Out Plan

Copies furnished to:

ERP Permitting, Southwest District, sw_erp@floridadep.gov
U.S. Army Corps of Engineers, tampareg@usace.army.mil
Kenneth Fraser, Jones Edmunds & Associates, Inc., kfraser@jonesedmunds.com

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this document and all attachments were sent on the filing date below to the following listed persons:

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to Section 120.52, F. S., with the designated Department Clerk, receipt of which is hereby acknowledged.

Cathy Rodriguez — December 21, 2023

Clerk **Date**

62-330.453 General Permit for Installation, Maintenance, Repair, and Removal of Utility Lines.

(1) A general permit is granted for the installation, maintenance, repair, and removal of underground utility lines, cable, conduit, or pipeline transmitting electricity, communication signals, potable water, raw water, reclaimed water, domestic wastewater, propane gas or natural gas.

(2) For the purposes of this general permit:

(a) "Directional drilling" means the linear or curvilinear excavation of a tunnel or conduit, in any direction, through the use of drilling equipment that can change direction during excavation; this also includes borehole reaming and pulling following primary drilling.

(b) "Jack-and-bore" means the linear, primarily lateral excavation of a tunnel, typically between excavated subgrade pits, through use of drilling equipment and encasement which is advanced under mechanical force, and includes similar methods commonly termed as "microtunneling."

(c) "Frac-out" means any release of drilling fluid or slurry which results in above-grade discharge of drilling fluid or slurry or significant loss of such fluid or slurry into the surrounding parent material.

(3) This general permit is limited as follows:

(a) No work occurs within Outstanding Florida Waters, Aquatic Preserves, or Class I waters.

(b) The installation of conduit or pipeline to drain wetlands or other surface waters is not authorized.

(c) Prior to work, existing pipelines shall be evacuated of substances which, if released, could result in a violation of state water quality standards.

(d) The maximum width of the disturbed corridor in wetlands shall not exceed 30 feet.

(e) The total area of forested wetland disturbance shall not exceed 0.5 acre per ten miles of cable, conduit, or pipeline.

(f) Minor above-grade improvements may be constructed in uplands under this general permit, but shall be limited to vents, valves, meter assemblies, relays, junction boxes, pads or similar structures that are directly connected to the utility line, do not create discharges, and which cumulatively comprise no more than 100 square feet of impervious surfaces per mile of utility line.

(g) Installation, maintenance, repair, and removal activities performed via trenching or methods other than directional drilling or jack-and-bore, are subject to the following special conditions:

1. The maximum width of the excavated trench shall not exceed eight feet, with temporary spoil storage banks not to exceed ten feet in width;

2. For a trench with a top width greater than three feet in herbaceous wetlands, the upper layer of the soil horizon shall initially be scraped and segregated into a spoil bank that is separated from the spoil bank resulting from the excavation of the trench for the utility line. The upper layer of the soil horizon shall be replaced as the last step of restored grades to facilitate natural revegetation;

3. Trenching in surface waters shall be limited to wetlands, artificial waters, and residential canal systems; and

4. Temporary spoil banks shall contain breaches that prevent impoundment or restriction of surface water flows;

(h) Installation, maintenance, repair, and removal conducted using directional drilling or jack-and-bore methods are subject to the following special conditions:

1. The maximum outside diameter of the cable, conduit or pipeline, including encasement, shall not exceed 30 inches.

2. A minimum depth of cover, equal to the greater of either five feet, or five times the maximum encased diameter of the utility line to be installed, shall be maintained between the top of the utility line and casing and the soil surface or submerged bottom of any wetland or waterbody being crossed.

3. All work areas associated with directional drilling or jack-and-bore activities, including entrance and exit pits, drill rigs, tanks, pumps, drilling fluid mixing and settling pits, dewatering systems and staging areas for pipe, cables, and drill string, shall be located within uplands.

4. The use of drilling fluids shall not cause or contribute to a violation of state ground water quality criteria or standards, as defined in chapter 62-520, F.A.C.

5. The permittee shall, at least 48 hours prior to commencement of any directional drilling or jack-and-bore activities, submit to the agency the name, as registered with the Florida Department of State, and all-hours telephone contact information of all contractors responsible for drilling and for containment and cleanup in the event of a drilling fluid frac-out or spill.

6. The contractor shall, at all times during directional drilling activities, maintain appropriate equipment and materials in a readily-accessible location and condition, to effectively contain and clean up a drilling fluid frac-out or spill.

7. The permittee or the permittee's contractor shall, at all times during directional drilling activities, ensure that appropriately-trained personnel monitor downhole equipment position, drilling fluid circulation and pressures, and actively monitor the entire utility line route for surface frac-out of drilling fluids.

8. Drilling activities shall be discontinued and the drilling fluid or slurry shall be contained using appropriate methods as soon as possible, in the event of a drilling fluid frac-out or spill. Removal of drilling fluid or slurry from wetlands and other surface waters shall be initiated and completed in the most expeditious manner practicable. Removed drilling fluid shall be contained or disposed of in an appropriate upland location. Any frac-out or spill of drilling fluid into wetlands or other surface waters shall be reported to Agency staff within 24 hours following detection of the spill or frac-out.

(i) Utilities must be located a minimum of 14 feet below the authorized depth of a federal navigation channel.

Rulemaking Authority 373.026(7), 373.043, 373.118(1), 373.406(5), 373.4131, 373.414(9), 373.418, 403.805(1) FS. Law Implemented 373.118(1), 373.406(5), 373.413, 373.4131, 373.414(9), 373.416, 373.418, 403.814(1) FS. History–New 10-3-95, Formerly 62-341.453, Amended 10-1-13, 6-1-18.

62-330.405 General Conditions for All General Permits

The following general permit conditions are binding upon the permittee and are enforceable under chapter 373, F.S. These conditions do not apply to the general permit for stormwater management systems under section 403.814(12), F.S.

(1) The general permit is valid only for the specific activity indicated. Any deviation from the specified activity and the conditions for undertaking that activity shall constitute a violation of the permit and may subject the permittee to enforcement action and revocation of the permit under

chapter 373, F.S.

(2) The general permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any construction, alteration, operation, maintenance, removal or abandonment authorized by this permit; and it does not authorize any violation of any other applicable federal, state, local, or special district laws (including, but not limited to, those governing the "take" of listed species).

(3) The general permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the general permit.

(4) The general permit does not relieve the permittee from liability and penalties when the permitted activity causes harm or injury to: human health or welfare; animal, plant or aquatic life; or property. It does not allow the permittee to cause pollution that violates state water quality standards.

(5) Section 253.77, F.S., provides that a person may not commence any excavation, construction, or other activity involving the use of state-owned or other lands of the state, the title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund without obtaining the required consent, lease, easement, or other form of authorization authorizing the proposed use. Therefore, the permittee is responsible for obtaining any necessary authorizations from the Board of Trustees prior to commencing activity on state-owned lands.

(6) The authorization to conduct activities under a general permit may be modified, suspended or revoked in accordance with chapter 120, F.S., and section 373.429, F.S.

(7) The general permit is not transferable to a new third party. To be used by a different permittee, a new notice to use a general permit must be submitted in accordance with rule 62-330.402, F.A.C. Activities constructed in accordance with the terms and conditions of a general permit are automatically authorized to be operated and maintained by the permittee and subsequent owners in accordance with subsection 62-330.340(1), F.A.C. Any person holding the general permit, persons working under the general permit, and owners of land while work is conducted under the general permit shall remain liable for any corrective actions that may be required as a result of any permit violations prior to sale, conveyance, or other transfer of ownership or control of the permitted project, activity, or the real property at which the permitted project or activity is located.

(8) Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the permitted system to ensure conformity with the plans and specifications approved by the general permit.

(9) The permittee shall maintain any permitted project or activity in accordance with the plans submitted to the Agency and authorized in the general permit.

(10) A permittee's right to conduct a specific activity under the general permit is authorized for a duration of five years.

(11) Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be implemented and maintained immediately prior to, during, and after construction as needed to stabilize all disturbed areas, including other measures specified in the permit to prevent adverse impacts to the water resources and adjacent lands. Erosion and sediment control measures shall be installed and maintained in accordance with the *State of Florida Erosion and Sediment Control Designer and Reviewer Manual (Florida Department of Environmental*

Protection and Florida Department of Transportation, June 2007), available at https://www.flrules.org/Gateway/reference.asp?No=Ref-04227, and the *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008)*, available at http://publicfiles.dep.state.fl.us/DEAR/Stormwater_Training_Docs/erosion-inspectors-manual.pdf.

(12) Unless otherwise specified in the general permit, temporary vehicular access within wetlands during construction shall be performed using vehicles generating minimum ground pressure to minimize rutting and other environmental impacts. Within forested wetlands, the permittee shall choose alignments that minimize the destruction of mature wetland trees to the greatest extent practicable. When needed to prevent rutting or soil compaction, access vehicles shall be operated on wooden, composite, metal, or other non-earthen construction mats. In all cases, access in wetlands shall comply with the following:

(a) Access within forested wetlands shall not include the cutting or clearing of any native wetland tree having a diameter four inches or greater at breast height;

(b) The maximum width of the construction access area shall be limited to 15 feet;

(c) All mats shall be removed as soon as practicable after equipment has completed passage through, or work has been completed, at any location along the alignment of the project, but in no case longer than seven days after equipment has completed work or passage through that location; and

(d) Areas disturbed for access shall be restored to natural grades immediately after the maintenance or repair is completed.

(13) Barges or other work vessels used to conduct in-water activities shall be operated in a manner that prevents unauthorized dredging, water quality violations, and damage to submerged aquatic communities.

(14) The construction, alteration, or use of the authorized project shall not adversely impede navigation or create a navigational hazard in the water body.

(15) Except where specifically authorized in the general permit, activities must not:

(a) Impound or obstruct existing water flow, cause adverse impacts to existing surface water storage and conveyance capabilities, or otherwise cause adverse water quantity or flooding impacts to receiving water and adjacent lands; or

(b) Cause an adverse impact to the maintenance of surface or ground water levels or surface water flows established pursuant to section 373.042, F.S., or a Works of the District established pursuant to section 373.086, F.S.

(16) If prehistoric or historic artifacts, such as pottery or ceramics, projectile points, stone tools, dugout canoes, metal implements, historic building materials, or any other physical remains that could be associated with Native American, early European, or American settlement are encountered at any time within the project site area, the permitted project shall cease all activities involving subsurface disturbance in the vicinity of the discovery. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance Review Section (DHR), at (850)245-6333, as well as the appropriate permitting agency office. Project activities shall not resume without verbal or written authorization from the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and the proper authorities notified in accordance with section 872.05, F.S.

(17) The activity must be capable, based on generally accepted engineering and scientific principles, of being performed and of functioning as proposed, and must comply with any

applicable District special basin and geographic area criteria.

(18) The permittee shall comply with the following when performing work within waters accessible to federally- or state-listed aquatic species, such as manatees, marine turtles, smalltooth sawfish, and Gulf sturgeon:

(a) All vessels associated with the project shall operate at "Idle Speed/No Wake" at all times while in the work area and where the draft of the vessels provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

(b) All deployed siltation or turbidity barriers shall be properly secured, monitored, and maintained to prevent entanglement or entrapment of listed species.

(c) All in-water activities, including vessel operation, must be shut down if a listed species comes within 50 feet of the work area. Activities shall not resume until the animal(s) has moved beyond a 50-foot radius of the in-water work, or until 30 minutes elapses since the last sighting within 50 feet. Animals must not be herded away or harassed into leaving. All onsite project personnel are responsible for observing water-related activities for the presence of listed species.

(d) Any listed species that is killed or injured by work associated with activities performed shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1(888)404-3922 and ImperiledSpecies@myFWC.com.

(e) Whenever there is a spill or frac-out of drilling fluid into waters accessible to the above species during a directional drilling operation, the FWC shall be notified at ImperiledSpecies@myfwc.com with details of the event within 24 hours following detection of the spill or frac-out.

(19) The permittee shall hold and save the Agency harmless from any and all damages, claims, or liabilities which may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any activity authorized by the general permit.

(20) The permittee shall immediately notify the Agency in writing of any submitted information that is discovered to be inaccurate.

Rulemaking Authority 373.026(7), 373.043, 373.118(1), 373.406(5), 373.4131, 373.414(9), 373.4145, 373.418, 403.805(1) FS. Law Implemented 373.044, 373.118(1), 373.129, 373.136, 373.406(5), 373.413, 373.4131, 373.414(9), 373.4145, 373.416, 373.422, 373.423, 373.429, 403.814(1) FS. History–New 10-3-95, Amended 10-1-07, Formerly 62-341.215, Amended 10-1-13, 6-1-18.

General Conditions for All Projects:

1. The time limit for completing the work authorized ends on July 27,2026.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while

accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner on the enclosed form (Attachment 10) and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Further Information:

1. Limits of this authorization.

   a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.

   b. This permit does not grant any property rightsor exclusive privileges.

   c. This permit does not authorize any injury to the property or rights of others.

   d. This permit does not authorize interference with any existing or proposed Federal projects.

2. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

   a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

   b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by oron behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or Construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

3. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

4. Reevaluation of Permit Decision: This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 3 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

5. Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CER 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date the enclosed form.

7. The Permittee understands and agrees that, if future operations by the United States

require the removal, relocation, or other alteration, of the structures or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the Permittee will be required, upon due notice from the U.S. Army Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal, relocation or alteration.

HORIZONTAL DIRECTIONAL DRILLING FRAC-OUT PLAN

1 INTRODUCTION

Horizontal directional drilling (HDD) is a trenchless pipeline installation method that is accomplished in three phases. The initial phase involves drilling a small-diameter pilot hole along a predetermined path. The second phase involves enlarging the pilot hole to a size suitable for the selected pipe. The third phase involves pulling the selected pipe through the borehole. All phases use drilling fluids, which generally consist of a mixture of fresh water, bentonite clay, and non-hazardous polymer additives.

The primary purposes of the drilling fluid during drilling operations are the following:

- Hydraulic cutting of soils by use of high-velocity jets in the drill bits.
- Lubricating, cooling, and cleaning of the drilling cutters.
- Transporting of soil cuttings and spoil by suspension in the fluid as it returns from the cutting head through the borehole to the surface at the entry or exit pits.
- Stabilizing the borehole against collapse and minimizing fluid loss to surrounding soils.
- Reducing friction during pullback of the selected pipe through the borehole.

The inadvertent return of the drilling fluids, also known as frac-out, occurs when the drilling fluid follows the path of least resistance and does not return as intended to the containment pits but rather to other areas along the HDD alignment. Although drilling fluid and pumping parameters can be adjusted to reduce the risk of frac-outs, they cannot be eliminated. The inadvertent return of fluids typically occurs near the HDD entry and exit points where the drill head is shallow. However, a frac-out during drilling operations can occur at any point along the route. The following can increase the risk of frac-outs:

- Highly permeable soils such as gravel.
- Soils consisting of loose sands or very soft clays.
- Clay soils that tend to swell in the presence of fluids.
- Considerable elevation differences between the entry or exit points and ground elevations along the HDD alignment.
- Disturbed soils such as fill or in soils adjacent to piles or other structures.
- Shallow sections along the HDD alignment.
- Locations along the HDD alignment where significant variations in density and/or composition of ground conditions are encountered (i.e., overburden/bedrock contact and other types of mixed-interface transition zones).
- Inappropriate downhole tooling or drilling practices.

Drilling fluid is classified as non-toxic to the aquatic environment and is a non-hazardous substance. Drilling fluids that are released typically contain a lower concentration of bentonite when they surface because the bentonite is filtered out as it passes through existing soils and sediment layers. However, if released to water bodies, the bentonite has a potential to adversely impact fish and invertebrates. The use of drilling fluids shall not cause

or contribute to a violation of state ground water quality criteria or standards, as defined in chapter 62-520, F.A.C.

2 PURPOSE

This HDD Frac-Out Plan establishes specific operational procedures and responsibilities for the prevention, containment, and cleanup of the inadvertent returns associated with each drilling installation. The Contractor shall adhere to this Frac-Out Plan, and each HDD installation shall be in accordance with the Contract Documents. The Contractor is solely responsible for the successful installation of each pipe by HDD and shall analyze each installation and make modifications as necessary to successfully install each pipe.

The overall objectives of this plan are to:

- Minimize the potential for frac-out associated with HDD activities.
- Provide best management practices (BMPs) consisted with Florida Department of Environmental Protection (FDEP) and applicable regulatory guidelines.
- Provide methods for timely identification and detention of frac-outs.
- Ensure an organized, timely response to ensure that minimal environmental impacts occur in the event of a frac-out.
- Ensure that all notifications are made immediately to the project owner, engineer, regulatory agencies, and safety personnel.

3 BEST MANAGEMENT PRACTICES

The Contractor will implement the following BMPs to minimize the potential for adverse environmental impacts during HDD activities:

1. The permittee shall, at least 48 hours prior to commencement of any directional drilling vactivities, submit to the agency the name, as registered with the Florida Department of State, and all-hours telephone contact information of all contractors responsible for drilling and for containment and cleanup in the event of a drilling fluid frac-out or spill.
2. BMPs for erosion control within the staging area shall be implemented at the start of Contractor mobilization and maintained at all times especially during the drilling, over-reaming, and utility pipe pull-in operations to prevent off-site siltation and turbid discharges in excess of State Water Quality Standards pursuant to Rule 62-302, Florida Administrative Code (FAC). BMP methods shall include but are not limited to the immediate placement of turbidity containment devices such as turbidity screens, silt containment fences, hay bales, sand bags, earth and stone berms, temporary containment swales, etc. to contain the drilling fluid. Earth berms or swales shall not be used where they may impact wetlands or other surface waters.
3. Drilling fluids for the HDD shall be a project-specific homogenous mixture of nontoxic, non-environmentally hazardous, bentonite clay, potable water, and polymer additive(s). All bentonite clay and polymer additives/stabilizing agents shall be preapproved by the Owner and Engineer.

4 PREVENTION OF FRAC-OUT SPILL

To provide an additional level of environmental protection, the following measures shall be taken to monitor any potential releases of drilling fluid:

1. The appropriate boring depth for the soil conditions shall be maintained along the drilling route and drilling fluid circulation pressures shall be properly managed.
2. Drilling fluid returns (flow of drilling fluids to the HDD entry/exit pit) shall be continuously visually monitored during the installation.
3. The volume and circulation pressure of drilling fluid shall be continuously monitored during the HDD operation. The HDD drill rig operator will monitor the downhole annular pressure at all times. Should a drop in volume occur, a visual inspection along the HDD corridor shall immediately be conducted. The visual inspection shall also include observation of adjacent waterbodies, wetlands, and drainage systems.
4. All drilling fluids associated with the HDD operation shall be contained onsite. The volume of the drilling fluids recirculation/solids settlement pit and onsite storage/frac tanks and watertight roll-off containers shall be determined by the Contractor and discussed with the Owner and Engineer before initiating each HDD. As required during the HDD process, screened solids and surplus drilling fluid shall be removed and disposed of off the project site at a location of the Contractor's choice in accordance with applicable regulations. At the conclusion of all drilling operations, drilling fluid remaining in the pit will be settled, removed completely from the entry and exit pits, and hauled to a disposal site of the Contractor's choice in accordance with applicable regulations within 48 hours of the pipe pull-in. The entry and exit pits will be backfilled and the disturbed pipe areas restored in accordance with the Contract Documents.
5. Adequate protection will be taken at all times to avoid impacts to wetlands, waterways, endangered species or habitats, existing infrastructure within public rights-of-way, and private property. This will include limiting or halting of construction or drilling activities and environmental protection measures such as erosion and sediment control devices.
6. A pump tanker or vacuum truck will be onsite and available at all times. The Contractor shall demonstrate to the Owner and Engineer that the contracted availability of additional pump tankers and/or vacuum trucks is needed for surplus or frac-out drilling fluids.
7. A drilling fluid spill kit will be onsite and available at all times. The kit will include but not be limited to absorbent pads, brooms, and shovels as well as personal protective equipment including but not limited to goggles and gloves.

5 RELEASE RESPONSE PROCEDURE

If the bore pressure is observed to be abnormally high or fluid loss is apparent and a release has occurred, the Contractor has the following options (or any combination of these options):

- Temporarily cease drilling operations and shut down the mud pump delivering drilling fluids downhole.

- Restart the pump and stroke the borehole in 30-foot (+/-) lengths to restore circulation ("swab" the hole) as many as six times but no fewer than two times.
- Introduce additional flow along the borehole starting at the entry/exit using "weeper" subs.
- Modify the drilling mud with a change in viscosity and/or lost circulation additives.

If the return drilling fluid is less than the projected amount to be recovered, the HDD Contractor shall immediately begin its search for the missing material by visually inspecting the HDD corridor, which includes inspection of adjacent waterbodies, wetlands, and drainage systems. Once the drilling fluid and frac-out is located, the drilling mud containment plan shall be immediately implemented.

If a frac-out is confirmed, all construction activity associated with the drilling shall cease immediately and the Contractor shall notify the Owner and Engineer of the confirmed occurrence. The notification should include a description and time of the frac-out, location, and the current environmental conditions of any impacted area.

If the frac-out is observed during pullback of the force main, the following procedures will be followed:

- The Contractor will implement all drilling fluid containment measures before continuing pullback.
- The Contractor will ensure that all reasonable measures within the limitations of current technology have been taken to re-establish circulation.
- The Contractor shall continue the HDD using a minimal amount of drilling fluid as required to penetrate the formation or to maintain a successful utility pipe pullback.

If the loss of drilling fluid or excess fluid pumping/recirculation pressure results in the heaving and/or settlement of pavement, curb, sidewalk and/or other infrastructure, the Contractor shall immediately mobilize all equipment, labor, and devices to recover the drilling fluid, relieve the fluid pressure, stop any heaving or settlement of infrastructure, and protect the public. The Contractor will prepare a remediation plan to repair, replace, or restore the affected infrastructure in accordance with the Contract Documents for approval by the Owner, Engineer, or right-of-way owner before implementation.

Before continuing with the HDD operation, the Contractor will prepare and submit for Owner and Engineer approval a revised HDD plan for successful completion of the required project. The plan shall identify the labor, equipment, drilling fluid, additives, pump pressures, original bore-hole sealing, and bore-path modifications that may be required.

6 CONTAINMENT

The released drilling fluid and materials shall be contained using methods in the BMPs. The materials shall be removed by a pump or vacuum truck.

The suction hose of the vacuum or pump shall be maneuvered and controlled to minimize the removal of natural bottom material and the disturbance of aquatic life and vegetation in any impacted body of water. If drilling fluids/materials are discharged to a surface water, containment and clean-up with a vacuum or pumping system will commence immediately

and be completed within a 24-hour period. The collected fluid/material will be disposed of by the Contractor at an approved disposal site. In this event, the HDD Contractor shall prepare a written report to be submitted to the Owner, Engineer, and applicable regulatory agencies within 10 business days, which summarizes the events that occurred. This summary should include the following:

- Details regarding the event, including an estimate on the gallons of drilling fluid released and the amount of drilling fluid recovered.
- Time, date, and location of the release.
- The size of the area impacted.
- The level of success of the clean-up activities.
- Name, company, address, and telephone number of the Contractor.
- Photograph/video of frac-out area and impacts.
- The type of activity that was occurring around the area of the inadvertent release.
- Description of any environmentally sensitive areas and their location in relation to the inadvertent release.
- Description of the methods used to clean up or secure the site.
- Changes to the drilling fluid properties or drilling process (if any) and the mitigation of any public utility infrastructure and water bodies from the frac-out.

7 CLEAN-UP

After completing the HDD installation, the Contractor shall develop site-specific clean-up measures for approval by the Owner and Engineer. The potential for secondary impact from the clean-up process will be evaluated together with the benefits of clean-up activities.

The following measures should be considered:

- All materials and construction debris will be removed at the end of each workday.
- Drilling mud will be removed using shovels, buckets, and soft-bristled brooms to minimize damage to existing vegetation.
- Freshwater washes may be used if determined to be beneficial and necessary.
- Containment structures will be pumped out and the ground surface scraped to bare topsoil to minimize the loss of topsoil or negative effects to adjacent vegetation.
- The recovered drilling fluid will be recycled or disposed of at an approved upland location or disposal facility. No recovered drilling fluids will be disposed of in waterbodies, wetlands, storm drains, or any environmentally sensitive areas.
- All protective BMP measures including hay bales, silt fences, and turbidity barriers will be removed unless otherwise specified by the Owner or Engineer.
- All containment structures, containers, and tanks will be removed.

8 FAILED INSTALLATION

While not expected, if an attempted HDD installation is unsuccessful, the proposed HDD alignment may be modified using the same general location along a revised bore path that is approved by the Owner and Engineer and is in accordance with all applicable regulatory requirements.

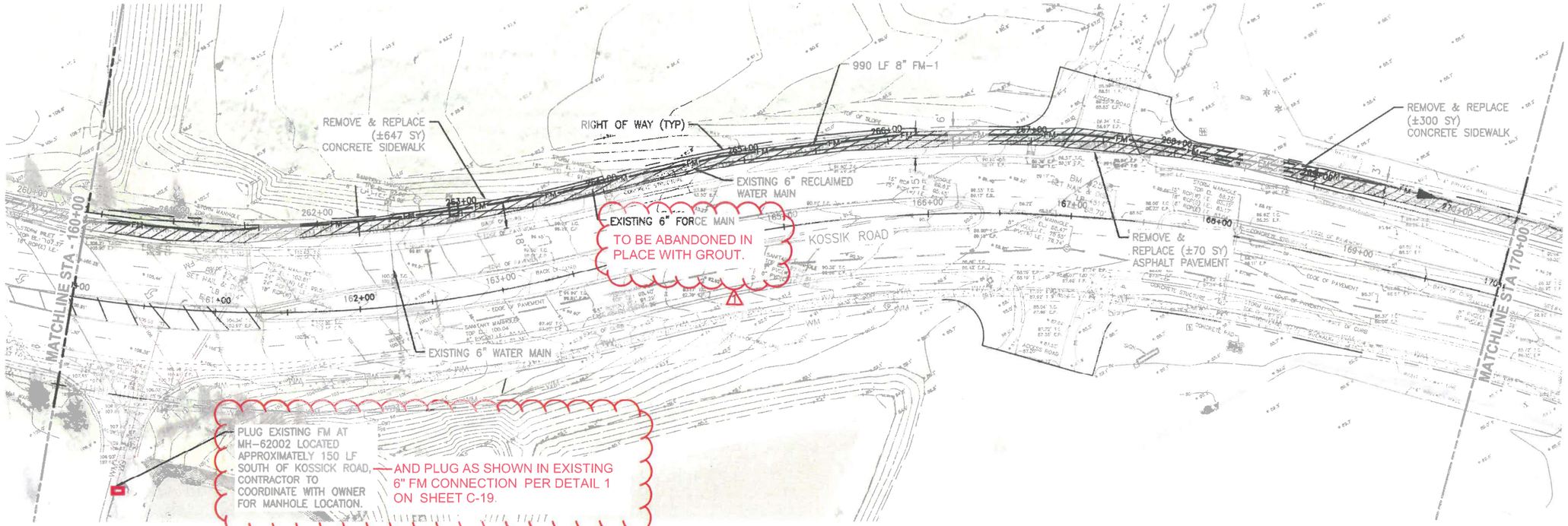
Before attempting a second HDD installation, a meeting will be held with the Owner and Engineer to determine the cause of the initial failure and any mitigation measures that could be adopted to reduce the risk(s) during the second HDD installation.

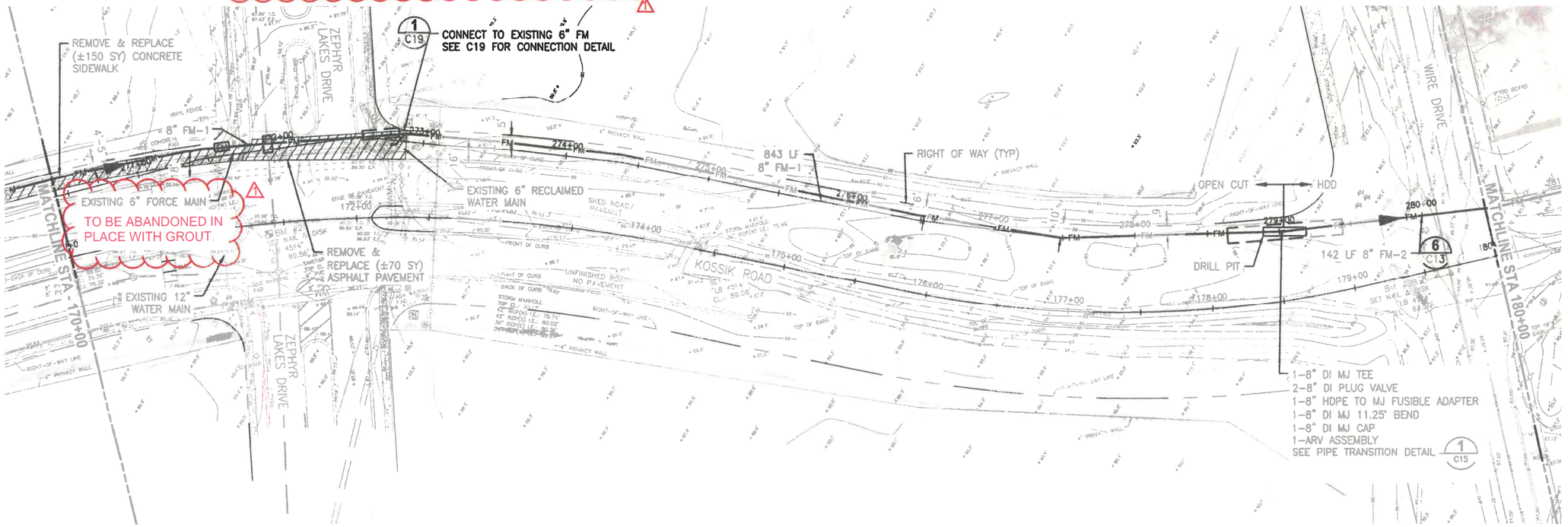
Potential causes that may lead to a failed HDD installation include:

1. Stuck or damaged utility pipe during pullback operations. This risk may be mitigated by:
    a. Completing a swab pass or passes to gauge the condition of the HDD bore by evaluating the drill rig effort required to pull tooling through the HDD bore.
    b. Only commencing pullback operations after verifying that the bore is adequately conditioned.
    c. Minimizing the amount of downtime associated with delays during pullback operations.
2. Bore instability/collapse. This risk may be mitigated by confirming that the alignment of the HDD profile is in favorable ground materials along the alignment and that are not amenable to raveling causing collapse of the bore.
3. Excess loss of drilling fluids and the inability to remove cuttings from the bore. This risk is mitigated by:
    a. Confirming that the alignment of the HDD profile is in favorable ground materials along the alignment.
    b. Evaluating the required and allowable drilling fluid pressures for the installation and providing sufficient separation between the required and allowable drilling fluid pressures.
    c. Incorporating temporary casing pipe to support shallow soils.

If the HDD bore could not be advanced and abandonment is required, the borehole will be grouted with an approved cement-based or bentonite material to fill the excavation and minimize risks of a potential groundwater flow pathway starting at the low point or end of the drill hole in accordance with Rule 62-532.500(4), FAC.

If an HDD installation is completed and the installed utility pipe is damaged so that it cannot be used for its intended purpose, the inside of the utility pipe shall be grouted with a cement-based grout and the annular space around the pipe grouted for approximately 200 feet at each HDD entry and exit location. This approach is outlined in the US Army Corps of Engineers' *Guidelines for Installation of Utilities Beneath Corps of Engineers Levees Using Horizontal Directional Drilling* (Latorre et al. 2002) that requires backfilling with grout or bentonite. Any additional requirements detailed in permits for this HDD installation will be met in terms of abandonment.





BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.
2	12/28/23	ADDENDUM 2	GSF	KF

DESIGNED K. FRASER
DRAWN S. SIMS
CHECKED D. PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

KOSSIK RD PLANVIEW

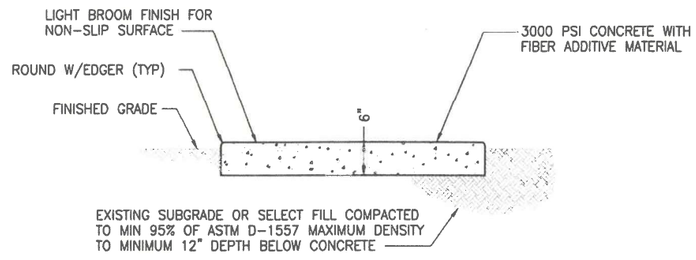
THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH A. FRASER, PE #57452 ON THE DATE SHOWN ON THE COVER SHEET.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

PROJECT NO:	DATE:
26110-053-01	NOV. 2023
INDEX NO:	DWG NO: C8

SAVED: 10/27/2023 3:06 PM KFRASER Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\053-01 NORTH SIDE LS PHASE 3\DESIGN&CONSTRUCTION\CAD\DWGS\CIVIL\26110053O1-C05.DWG

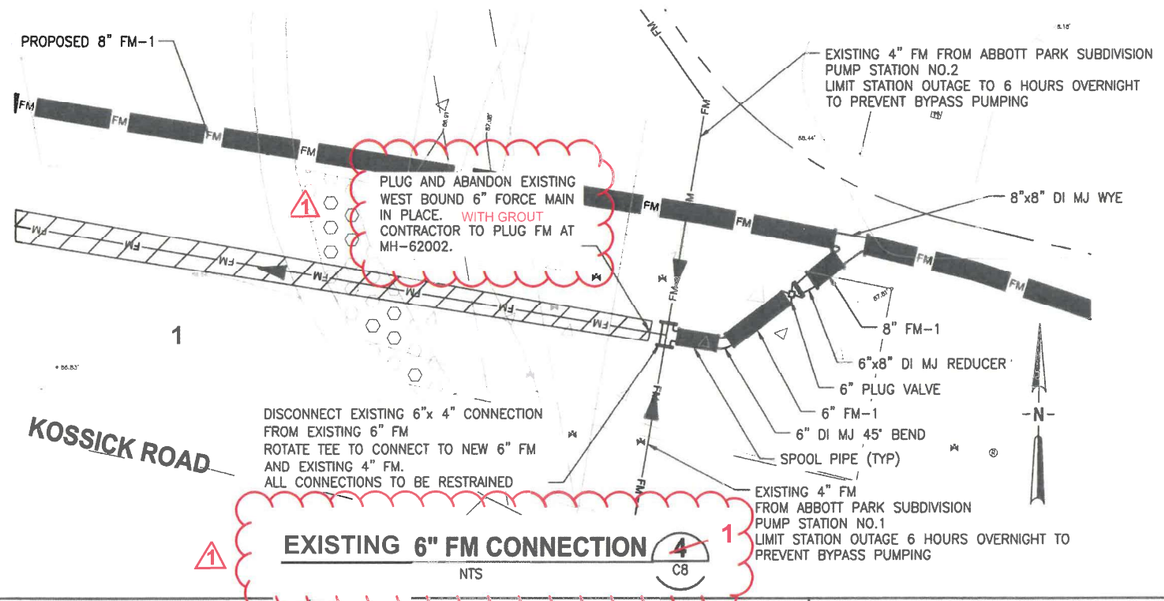
PLOTTED: 11/8/2023 11:26:33 AM KEYLA VIRGILIO, EI



NOTE:
SIDEWALK JOINTS SHALL BE PER FDOT INDEX 310.

CONCRETE RAMP AND SIDEWALK DETAIL 3

NTS



1 EXISTING 6" FM CONNECTION 4

NTS

C8

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.
1	12/28/23	ADDENDUM 2	GSF	KF

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

CIVIL DETAILS

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH A. FRASER, PE #57452 ON THE DATE SHOWN ON THE COVER SHEET.

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PROJECT NO: 26110-053-01
DATE: NOV. 2023
INDEX NO:
DWG NO: C19

SAVED: 9/29/2023 3:30 PM KFRASER Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\053-01 NORTH SIDE LS PHASE 3\DESIGN&CONSTRUCTION\CAD\DWGS\CIVIL\26110053O1-C17.DWG

BASE BID

Item 1. Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions (not to exceed 5% of the Base Bid)—This item shall include and cover the costs for performing construction; preparatory and overhead operations including but not limited to movement of personnel and equipment to and from the site; sanitary facilities; project administration and management; insurance; Owner and Engineer indemnification; temporary utilities; permits related to construction; performance and payment bonds in accordance with Florida Statutes 225.05; site safety and health program during the execution of the Construction Contract that complies with all local, state, and federal safety guidelines and laws; and all other similar activities and facilities necessary for executing this project. This lump-sum item shall not exceed 5% of the Base Bid amount. The Contractor will be paid 20% of this item upon completion of mobilization and 10% upon demobilization; the remainder will be prorated equally over the construction period.

Item 2. Traffic Control—The Contractor shall furnish all labor, signage, barricades, and other equipment necessary to provide traffic control in accordance with the Florida Department of Transportation (FDOT) Standard Specifications for all phases of work and all other maintenance of traffic plans as may be required by local, county, or state agencies. The Contractor will be paid 40% of this lump-sum item upon delivery and set up of the materials, and the remainder will be prorated equally over the construction duration.

Item 3. Environmental Protection—This item shall include but not be limited to all costs for providing a comprehensive environmental protection program for the project site and other areas as may be affected by the construction. This includes providing labor and materials necessary to prevent environmental damage to the ground, water, and air in conformance with all local, state, and federal laws. Examples include control of stormwater, erodible soils, noise, dust, pollutants, trash, waste, pumping discharge, and any other substance or activity that may adversely impact the environment. The Contractor will be paid 40% upon delivery and set up of the materials, and the remainder will be prorated equally over the construction period.

Item 4. Construction Survey and Layout—This item shall include all costs for providing the services of a Professional Land Surveyor to perform pre-construction stakeout; establish vertical control; and establish horizontal control, right-of-way locations, property boundary locations, and Record Drawing information verification and certification in accordance with the Contract Documents and to the satisfaction of the Owner. The Contractor will be paid 40% of this lump-sum item upon initial project layout, and the remainder will be prorated equally over the duration of construction.

Item 5. 6-Inch, 8-inch Sanitary Sewer Force Main via Open-Cut—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 6-inch and 8-inch sanitary sewer force mains installed by open cut as shown on the Drawings in accordance with the Contract Documents, including but not limited to provide vacuum trucks and/or pumps/pipe/fittings for bypass pumping of sewer flow during force main connections, and

grout filling of all existing piping designed to be abandoned in place, all polyvinyl chloride (PVC) pipe, ductile iron (DI) pipe, DI fittings and connections, pipe restraints, end plugs, tracing wire, flushing of all lines, connections, excavation, backfill, compaction, sodding/seeding, pressure testing, all associated appurtenances, and any other incidentals necessary for a complete and operable system as designed. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 6. 6-Inch, 8-inch Sanitary Sewer Force Main via Horizontal Directional Drilling (HDD)—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 6-inch and 8-inch sanitary sewer force main via HDD as shown on the Drawings in accordance with the Contract Documents, including but not limited to bore pits, piping, boring, reaming, back-reaming, slurry, slurry relief holes, installing the pipe in the bore, connections and transition couplings, high-density polyethylene (HDPE) reducers, HDPE fittings, removing or avoiding obstructions in the path of the HDPE pipe, existing utility coordination and relocation, excavation, backfill, compaction, sodding/seeding, site restoration, pressure testing, disinfection, disposal of soil (including disposal of soil/slurry mixture), and all associated appurtenances. Concrete, asphalt, or limerock repairs required specifically for the HDD installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 7. 12-Inch Potable Water Main via Open-Cut—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 12-inch potable water main via open-cut as shown on the Drawings in accordance with the Contract Documents, including but not limited to all PVC pipe, DI fittings and connections, pipe restraints, end plugs, fire hydrants, tracing wire, flushing of all lines, connections, excavation, backfill, compaction, sodding/seeding, landscape restoration, mailbox and other improvements restoration, existing utility coordination and relocation, pressure testing, bacteriological testing, all associated appurtenances, and any other incidentals necessary for a complete and operable system as designed. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe. No deduction in length will be made for the space occupied by valves or fittings. Concrete, asphalt, or limerock repairs required specifically for the open-cut water main installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid on a unit-price basis for each linear foot of water main installed complete as measured in place.

Item 8. Combination Air/Vacuum Valves and Vaults—The Contractor shall furnish and install all labor, materials, equipment, and services for constructing and placing into operation combination air/vacuum valves and vaults as shown on the Drawings in accordance with the Contract Documents, including but not limited to combination air/vacuum valves, pipe saddles, corporation stops, pipe, fittings, isolation valves, gravel bedding, valve boxes, valve manholes

NORTHSIDE LIFT STATION –
WATER/ WASTEWATER FORCE MAIN - PHASE 3
CITY OF ZEPHYRHILLS

City Bid No. ITB 2023-02
Jones Edmunds Project No. 26110-053-01

ADDENDUM NO. 3

December 29, 2023

BIDS DUE: 10:00 AM, Local Time, January 12, 2024

TO ALL CONTRACTORS BIDDING ON THIS PROJECT:

The changes, additions, substitutions, and/or deletions contained in Addendum No. 3 are hereby made part of the Contract Documents fully and completely for the construction of the City of Zephyrhills Northside Lift Station, Water / Wastewater Force Main, Phase 3, Jones Edmunds & Associates, Inc., Project No. 26110-053-01, for the City of Zephyrhills, dated December 2023.

Bidders Question:

1. Is there tree removal on this project? If so, do you have an quantity of tree removal?

1. **City / Engineer's Response:**
   The project is anticipated to have minimum tree removal. In the event that trees are identified to be removed for construction, these will be handled on a case-by-case basis.

Bidders Question:

2. Can the section that runs through the easement where the owner have taken over that land for farming be directionally drilled instead of open cut as shown? There are no service connections going in there and it seems that limiting the tree clearing and not disturbing the homeowners would be a more ideal option.

2. **City / Engineer's Response:**
   This alternative along with any others that have been identified by the Contractor can be discussed with the City / Engineer at the Pre-Construction Meeting.

END OF ADDENDUM

Reference was made to the language located in the Technical Specifications, Section 01100, Summary of Work, Part 1, Section 1.07 Reimbursement Fees in which "Supplementary Conditions" were referred to.

Supplementary Conditions referenced in this section do not apply to this project.

US Water Services Corporation Proposal

Pricing unsealed at Jan 12, 2024 10:00 AM

CONTACT INFORMATION

Company
US Water Services Corporation

Email
ccrego@uswatercorp.net

Contact
Christina Crego

Address
4939 CROSS BAYOU BOULEVARD
New Port Richey FL 34652
NEW PORT RICHEY, FL 34652

Phone
(727) 848-8292 Ext: 222

Website
www.uswatercorp.com

Submission Date
Jan 12, 2024 9:50 AM

ADDENDA CONFIRMATION

Addendum #1
Confirmed Dec 29, 2023 2:26 PM by Christina Crego

Addendum #2
Confirmed Dec 29, 2023 2:26 PM by Christina Crego

Addendum #3
Confirmed Dec 29, 2023 2:26 PM by Christina Crego

Addendum #4
Confirmed Jan 9, 2024 10:40 AM by Christina Crego

QUESTIONNAIRE

1. Respondent Submittals (without Cost)* ☐ Pass ☐ Fail

Please Upload your COMPLETE response, including any and all required forms listed in the solicitation and the corresponding attachments.

(Do not upload cost information in here)

3.1._Page_22,_Signed_and_Notarized--In_Response_(signed).pdf

3.2._Bid_Bond_(signed).pdf

3.3._Public_Entity_Crimes_(signed).pdf

3.4._E-Verify_Certification_Form_(signed).pdf

3.5._Addenda_Acknowledgment_(signed).pdf

3.6._Drug_Free_Workplace_(signed).pdf

3.7._Non-Collusive_Affidavit_(signed).pdf

3.8._Errors_or_Omissions_(signed).pdf

3.9._References-Similar_in_Scope_(completed).pdf

3.10._References-Projects_Actively_On_(completed).pdf

3.11._Certification_-Debarment,_Suspension_(signed).pdf

3.12._Trench_Safety_form_(signed).pdf

3.13._Bid_Form-Part_1_Summary_(signed).pdf

3.14._Bid_Form-Part_2_Detailed_A2.pdf

3.15._Bid_Cover_Sheet-Signed_Notarized_(signed).pdf

CGC003307_Cecil_Delcher_08.2024.pdf

CUC1223914_G.Deremer_08.2024.pdf

Detail_by_Entity_Name_01.2024.pdf

USW_W-9_Signed.pdf

2. I certify that I have read, understood and agree to the terms in this solicitation, and that I am authorized to submit this response on behalf of my company.*

☑ Confirmed ☐ Pass ☐ Fail

3. Response Checklist

By selecting confirm, you are certifying that you have submitted the corresponding attachments and documents as part of your submittal in the question, "Respondent Submittals (without cost)".

3.1. Page 22, Signed and Notarized--In Response ☐ Pass ☐ Fail

☑ Confirmed

3.2. Bid Bond Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.3. Public Entity Crimes-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.4. E-Verify Certification Form-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.5. Addenda Acknowledgment-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.6. Drug Free Workplace-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.7. Non-Collusive Affidavit-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.8. Errors or Omissions-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.9. References-Similar in Scope Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.10. References-Projects Actively On-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.11. Certification -Debarment, Suspension Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.12. Trench Safety form-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.13. Bid Form-Part 1 Summary - Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.14. Bid Form-Part 2 Detailed-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.15. Bid Cover Sheet-Signed/Notarized-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

PRICE TABLES

Northside Ph 3 Force Main/Water Line Ext

Item No.	Item Description	Quantity	Unit	Unit Price	Amount Total
1	Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements and General Conditions	1	LS	$107,676.00	$107,676.00
2	Traffic Control	1	LS	$25,000.00	$25,000.00
3	Environmental Protection	1	LS	$125,555.00	$125,555.00
4	Construction Survey and Layout	1	LS	$34,500.00	$34,500.00
5	6-Inch Sanitary Sewer Force Main via Open-Cut	9350	LF	$57.00	$532,950.00
6	6-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	3400	LF	$45.00	$153,000.00
7	8-Inch Sanitary Sewer Force Main via Open-Cut	4874	LF	$69.00	$336,306.00
8	8-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	250	LF	$66.00	$16,500.00

9	12-Inch Potable Water Main via Open-Cut	4525	LF	$105.00	$475,125.00
10	Combination Air/Vacuum Valves and Vaults	14	EA	$4,582.06	$64,148.84
11	Concrete Restoration	2150	SY	$150.00	$322,500.00
12	Limerock Restoration	406	SY	$35.00	$14,210.00
13	Asphalt Concrete Restoration	1033	SY	$35.00	$36,155.00
14	Testing Allowance ($25,000) Include this amount in your Total	1	AL	$25,000.00	$25,000.00
15	Record/As-Bult Drawings Allowance ($15,000) Include this amount in your Total	1	AL	$15,000.00	$15,000.00
	Total				**$2,283,625.84**

Contingency

10% of Total Bid Form

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	Contingency - 10%	1	EA	$228,362.58	$228,362.58
	Total				**$228,362.58**

Guarantee and Warranties: Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the City, shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor/Vendor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The

Contractor/Vendor shall remedy any defect in the work and pay for any damage to other work resulting there from, which shall appear within a period of one (1) year from the date of final acceptance of the work unless a longer period is specified. The City will give notice of observed defects with reasonable promptness.

All guarantees and warranties shall commence on the date of substantial completion or on acceptance by the owner of re-work items. The Contractor shall furnish a one (1) year unconditional warranty. The warranty shall include all manufacturers' warranties on equipment and material installed by the Contractor or any subcontractors. These items shall be transferred to the City and in the City's name. All warranty items shall be secured in an organized 3-ring binder.

City May Stop the Work: If the work is defective, or the Contractor/Vendor fails to supply sufficient skilled workmen or suitable materials or equipment or if the Contractor/Vendor fails to make prompt payments to Subcontractors for labor, materials, or equipment, the City may order the Contractor/Vendor to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the City to stop the work shall not give rise to any duty on the part of the City to exercise this right for the benefit of the Contractor/Vendor or any other party.

For each consecutive calendar day that the work remains incomplete after the date established for final completion, the Contractor/Vendor shall pay City and the City is authorized to retain from the compensation otherwise to be paid to the Contractor/Vendor the sum of the phase schedule, **$1000.00**. This amount is the minimum measure of damages the City will sustain by failure of the Contractor to complete all remedial work, correct deficient work, clean up the project and other miscellaneous tasks as required to complete all work specified. This amount is in addition to the liquidated damages prescribed above, and likewise shall not be construed as a penalty.

The Bidder hereby agrees that the City reserves the right to waive any bid and to reject any or all bids, or to accept any bid that in its judgment will be in the best interest of the City. The bidder's signature understands and acknowledges the requirements set forth in this bid package.

Signature/Print Name/Company

Gary Deremer, U.S. Water Services Corporation

January 12, 2024
Date

In witness whereof, the Bidder has hereunto set his signature and affixed his seal this 12th day of January A.D. ~~2023~~ 2024

(Seal)

By: Gary Deremer

Title: President

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

THE AMERICAN INSTITUTE OF ARCHITECTS

Executed in 1 Counterpart(s)

AIA Document A310

Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we
U. S. Water Services Corporation
4939 Cross Bayou Blvd.
New Port Richey, FL 34652
(Here insert full name and address or legal title of Contractor/Vendor)

as Principal, hereinafter called the Principal, and
Swiss Re Corporate Solutions America Insurance Corporation
1200 Main Street, Suite 800, Kansas City, MO 64105
(Here insert full name and address or legal title of Surety)
a corporation duly organized under the laws of the State of Missouri
as Surety, hereinafter called the Surety, are held and firmly bound unto
Zephyrhills FL
5335 8th Street, Zephyrhills, FL 33542
(Here insert full name and address or legal title of Owner)

Bonds and All Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

as Obligee, hereinafter called the Obligee, in the sum of Five Percent of Bid Amount
----------**Dollars ($** 5% of Bid

for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, The Principal has submitted a bid for
ITB-2023-02 Northside Water/Wastewater Force Main-Phase 3
(Here insert full name, address and description of project)

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and Sealed this 12th ***of*** January ***2023***

U. S. Water Services Corporation

(Principal and Title) State of Incorporation: Florida
Gary Doremer, President

(Seal)

(Witness)

(Attorney-in-Fact & Licensed Resident Agent) April L. Lively
Swiss Re Corporate Solutions America Insurance Corporation
Guignard Company/Inquiries (407) 834-0022

(Surety Seal)

SWORN STATEMENT PURSUANT TO SECTION 287.133(3)(a),

SWISS RE CORPORATE SOLUTIONS

SWISS RE CORPORATE SOLUTIONS AMERICA INSURANCE CORPORATION ("SRCSAIC")
SWISS RE CORPORATE SOLUTIONS PREMIER INSURANCE CORPORATION ("SRCSPIC")
WESTPORT INSURANCE CORPORATION ("WIC")

GENERAL POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, THAT SRCSAIC, a corporation duly organized and existing under laws of the State of Missouri, and having its principal office in the City of Kansas City, Missouri, and SRCSPIC, a corporation organized and existing under the laws of the State of Missouri and having its principal office in the City of Kansas City, Missouri, and WIC, organized under the laws of the State of Missouri, and having its principal office in the City of Kansas City, Missouri, each does hereby make, constitute and appoint:

J.W. GUIGNARD, BRYCE R. GUIGNARD, PAUL J. CIAMBRIELLO, APRIL L. LIVELY, JENNIFER L. HINDLEY, MARGIE L. MORRIS, DEBORAH ANN MURRAY, M. GARY FRANCIS, CHRISTINE MORTON, KELLY PHELAN, and ALLYSON FOSS WING

JOINTLY OR SEVERALLY

Its true and lawful Attorney(s)-in-Fact, to make, execute, seal and deliver, for and on its behalf and as its act and deed, bonds or other writings obligatory in the nature of a bond on behalf of each of said Companies, as surety, on contracts of suretyship as are or may be required or permitted by law, regulation, contract or otherwise, provided that no bond or undertaking or contract or suretyship executed under this authority shall exceed the amount of:

TWO HUNDRED MILLION ($200,000,000.00) DOLLARS

This Power of Attorney is granted and is signed by facsimile under and by the authority of the following Resolutions adopted by the Boards of Directors of both SRCSAIC and SRCSPIC at meetings duly called and held on the 18th of November 2021 and WIC by written consent of its Executive Committee dated July 18, 2011.

"RESOLVED, that any two of the President, any Managing Director, any Senior Vice President, any Vice President, the Secretary or any Assistant Secretary be, and each or any of them hereby is, authorized to execute a Power of Attorney qualifying the attorney named in the given Power of Attorney to execute on behalf of the Corporation bonds, undertakings and all contracts of surety, and that each or any of them hereby is authorized to attest to the execution of any such Power of Attorney and to attach therein the seal of the Corporation; and it is

FURTHER RESOLVED, that the signature of such officers and the seal of the Corporation may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be binding upon the Corporation when so affixed and in the future with regard to any bond, undertaking or contract of surety to which it is attached."

SWISS RE CORPORATE SOLUTIONS AMERICA INSURANCE CORPORATION CORPORATE SEAL 1975 MISSOURI

SWISS RE CORPORATE SOLUTIONS PREMIER INSURANCE CORPORATION CORPORATE SEAL MISSOURI

By_____
Erik Janssens, Senior Vice President of SRCSAIC & Senior Vice President of SRCSPIC & Senior Vice President of WIC

By_____
Gerald Jagrowski, Vice President of SRCSAIC & Vice President of SRCSPIC & Vice President of WIC

WESTPORT INSURANCE CORPORATION CORPORATE SEAL MISSOURI

IN WITNESS WHEREOF, SRCSAIC, SRCSPIC, and WIC have caused their official seals to be hereunto affixed, and these presents to be signed by their authorized officers

this 10 day of NOVEMBER, 20 22

Swiss Re Corporate Solutions America Insurance Corporation
Swiss Re Corporate Solutions Premier Insurance Corporation
Westport Insurance Corporation

State of Illinois
County of Cook ss

On this 10 day of NOVEMBER, 20 22, before me, a Notary Public personally appeared Erik Janssens, Senior Vice President of SRCSAIC and Senior Vice President of SRCSPIC and Senior Vice President of WIC and Gerald Jagrowski, Vice President of SRCSAIC and Vice President of SPCSPIC and Vice President of WIC, personally known to me, who being by me duly sworn, acknowledged that they signed the above Power of Attorney as officers of and acknowledged said instrument to be the voluntary act and deed of their respective companies.

OFFICIAL SEAL
CHRISTINA MANISCO
NOTARY PUBLIC, STATE OF ILLINOIS
My Commission Expires March 28, 2026

Christina Manisco, Notary

I, Jeffrey Goldberg, the duly elected Senior Vice President and Assistant Secretary of SRCSAIC and SRCSPIC and WIC, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney given by said SRCSAIC and SRCSPIC and WIC, which is still in full force and effect.
IN WITNESS WHEREOF, I have set my hand and affixed the seals of the Companies this 12th day of January, 20 24.

Jeffrey Goldberg, Senior Vice President & Assistant Secretary of SRCSAIC and SRCSPIC and WIC

FLORIDA STATUTES ON PUBLIC ENTITY CRIMES- ITB-2023-02

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.

A. This sworn statement is submitted to City of Zephyrhills
(print name of the public entity)

by Gary Deremer, President
(print individual's name and title)

for U.S. Water Services Corporation
(print name of entity submitting sworn statement)

whose business address is

4939 Cross Bayou Blvd., New Port Richey FL 34652

and (if applicable) its Federal Employer Identification Number (FEIN) is 20-0008821
(If the entity has no FEIN, include the Social ro Number of the individual signing this sworn statement: .)

B. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

C. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

D. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes means:

a. A predecessor or successor of a person convicted of a public entity crime; or
b. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

E. I understand that a "person" as defined in Paragraph 287.133(1)(e), Florida Statutes means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or

applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

F. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Indicate which statement applies.)

X Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (attach a copy of the final order)

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

_____
(Signature) Gary Deremer, President
U.S. Water Services Corporation
4939 Cross Bayou Blvd. New Port Richey FL 34652
State of Incorporation: Florida

Sworn to and subscribed before me this 12th day of January 2024, 2023 Personally or known
Or Produced identification_____ Notary Public – State of Florida

_____
My commission expires 1/26/2025 (Type of Identification) _____
(Printed, Typed or stamped commissioned name of notary public)

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

E-VERIFY CERTIFICATION FORM- ITB 2023-02

All vendors, contractors and subcontractors doing business with the City of Zephyrhills must certify that they have implemented the federal E-Verify program.

E-Verify is a federal system established by the Department of Homeland Security to determine the immigration and work-eligibility status of prospective employees. Detailed E-Verify program information for employers can be found at http://www.dhs.gov/e-verify

Prior to providing goods or services to the City of Zephyrhills, vendors must certify compliance with the federal E-Verify program. In the case of contractors, this includes obtaining written certification from all subcontractors who will participate in the performance of the contract. The certification below has been prepared for all vendors and contractors to use for this purpose. All subcontractor certifications must be kept on file with the contract vendor and made available to the state and/or City upon request.

CERTIFICATION

(In accordance with Executive Order No. 11-02)

I certify that the company shown below is in compliance with the above statement and that I am authorized to sign on its behalf.

Name of Company: U.S. Water Services Corporation

Authorized Signature:

Printed Name/Title: Gary Deremer, President

Address: 4939 Cross Bayou Blvd., New Port Richey FL 34652

Date: January 12, 2024

Phone: 727 848 8292 x 222

Email: CCREGO@USWATERCORP.NET

The City of Zephyrhills reserves the right to determine how it will respond to any instances of non-compliance or false certification of compliance. Potential City actions include, but are not limited to, cancellation of the contract and/or suspending or debarring the contract vendor from performing services in any aspect to the City.

Please send the completed form with your submittal.

DRUG-FREE WORKPLACE FORM- ITB 2023-02

The undersigned vendor, in accordance with Florida Statute 287.087, hereby

certifies that U.S. Water Services Corporation does:
(Name of Business)

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business' policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or pleas of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm fully complies with the above requirements.

Bidder's Signature

Gary Dermer, President
U.S. Water Services Corporation
4939 Cross Bayou Blvd., New Port Richey FL 34652
State of Incorporation: Florida

January 12, 2024
Date

PUR062.036
re. 10/97

DRUG-FREE WORKPLACE FORM- ITB 2023-02

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(Name of Business)

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Bidder's Signature

Gary Dermer, President
U.S. Water Services Corporation
4939 Cross Bayou Blvd., New Port Richey FL 34652
State of Incorporation: Florida

January 12, 2024
Date

PUR062.036
re. 10/97

NON-COLLUSIVE AFFIDAVIT- ITB 2023-02

State of Florida
County of Pasco

Gary Deremer, being first duly sworn, deposes and says that he/she is

President of U.S. Water Services Corporation, the party making the fore-going submittal of qualifications or bid that such submittal
(partner or officer of the Firm, etc)

Or bid is genuine and not collusive or sham; that said Firm has not colluded, conspired, connived or agreed, directly or indirectly, with any Firm or person, to put in a sham response or to refrain from responding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person, to secure any advantage against the City of Zephyrhills of any person interested in the proposed contract; and that all statements in said response are true.

Officer Gary Deremer, Presidemt
State of Incorporation: Florida

U.S. Water Services Corporation *(Company Name)*
4939 Cross Bayou Blvd.,
New Port Richey FL 34652

State of Florida
County of Pasco

The foregoing instrument was acknowledged before me this 12th day of January 2024
by
Gary Deremer, President *(name and title of corporate officer)*
of U.S. Water Services Corporation *(Name of Corporation),*
a Florida *(state or place of incorporation)* corporation, on behalf of the corporation. He/she is personally known to me or has produced _____ *(Identification type)*
as identification.

Christina R. Crego *(Signature line for notary public)*

Christina R. Crego *(Name of notary type, printed or stamped)*

_____ *(Title or rank)*

My commission expires: January 26, 2025
Serial number, if any _____

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

Errors or Omissions- ITB 2023-02

Upon review of this project's plans and construction documents are you aware of any apparent errors or omissions?

☐ YES

☒ No

If YES, please provide a detailed explanation of any apparent errors or omissions on this sheet.

January 12, 2024

Company Representative **Date**

Gary Deremer, President
U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652
State of Incorporation: Florida

REFERENCES –PROJECTS OF SIMILAR SCOPE- ITB 2023-02

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: Hernando County BOCC
Project Name: Hill-N-Dale WM Replacement Project Amount: $ 782,593.20
Start Date: 1/31/22 Finished Date: 11/14/23
Description: Installation of new water mains and fire hydrants in the Azen Loop service area of the Hill-n-Dale subdivision to replace the existing aging water mains and abandon the existing water mains and meters that are in the customers back yards and replace them with new water mains and meters that will be installed in the road right-of-way for easier maintenance.
Contact Name: Charles Turner, PM Phone: 352 540 6219
Email: cturner@hernandocounty.us Within Budget: YES ☒ NO ☐ *Explain

Reference 2: Company Name: Hernando County BOCC
Project Name: Berkeley Manor Flow Diversion LS Rehab Project Amount: $ 742,165.28
Start Date: 1/13/22 Finished Date: 5/5/23
Description: installation of a new generator. The existing wet well, new valve vault, and new collector manhole will be coated per HCUD specifications Section 9. The station will receive a new electrical service and panel as well. There is approximately 900' of ten inch force main to be installed along with an approximately 170' of eight inch force main under US 19 via directional bore.
Contact Name: Brad Smith, PM Phone: 352 758 4858
Email: bsmith@hernandocounty.us Within Budget: YES ☒ NO ☐ *Explain

Reference 3: Company Name: City of Hampton
Project Name: Water Main Loop Project Phase 2 Project Amount: $ 212,298.00
Start Date: 12/16/22 Finished Date: 8/8/23
Description: Loop water mains to improve water conservation, remove dead ends to improve water quality, reduce system flushing, and reduce water age associated with water stagnation at dead ends. New isolation valves to improve the capability to repair line breaks.
Contact Name: Mary Lou Hildreth Phone: 352 468 1201
Email: coh1@outlook.com Within Budget: YES ☒ NO ☐ *Explain

Reference 4: Company Name: City of Leesburg
Project Name: FM Installation - Canal Street WWTF Project Amount: $ 96,416.63
Start Date: 8/2/21 Finished Date: 11/9/21
Description: Replacement of a force main from an existing 16-inch ductile iron force main over to a new 16-inch C900 PVC force main. The old ductile iron force main will then be abandoned and shall be grout filled with flowable fill and properly capped.
Contact Name: Ryan Gerdon Phone: 352 705 0248
Email: Ryan.gerdon@leesburgflorida.gov Within Budget: YES ☒ NO ☐ *Explain

* Additional references on next page

REFERENCES –PROJECTS OF SIMILAR SCOPE- ITB 2023-02

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: City of Hampton
Project Name: Water Main Loop Project Project Amount: $ 158,717.59
Start Date: 7/2/21 Finished Date: 9/30/21
Description: Loop water mains to improve water conservation, remove dead ends to improve water quality, reduce system flushing, and reduce water age associated with water stagnation at dead ends. New isolation valves to improve the capability to repair line breaks.

Contact Name: Mary Lou Hildreth Phone: 352 468 1201
Email: coh1@outlook.com Within Budget: YES ☒ X NO ☐ *Explain

Reference 2: Company Name: City of Leesburg
Project Name: Gravity Main-Pamela Street - 210171 Project Amount: $ 178,931.00
Start Date: 8/2/21 Finished Date: 9/15/21
Description: Relocate existing sewer main. A new sewer main will be constructed and the old sewer main abandoned in place with flowable fill.

Contact Name: Ryan Gerdon Phone: 352 705 0248
Email: Ryan.Gerdon@leesburgflorida.gov Within Budget: YES ☒ X NO ☐ *Explain

Reference 3: Company Name: City of Waldo
Project Name: CDBG 18 NR Water Main Replacements Project Amount: $ 410,220.35
Start Date: 5/18/20 Finished Date: 3/22/21
Description: The Project consisted of furnishing all labor, equipment, and materials necessary to construct approximately 4,200 LF of 6" PVC water mains, including valves, fittings, fire hydrants, water services, and associated restoration; and the rehabilitation of Lift Station No. 1, including new pumps, piping, control panel, etc.
Contact Name: Timothy Norman, P.E. Phone: 904 278 0030
Email: Tnorman@mittauer.com Within Budget: YES ☒ X NO ☐ *Explain

Reference 4: Company Name: FGUA
Project Name: Colonial Manor WM Replacement, CSP08 Project Amount: $ 1,566,312.29
Start Date: 10/8/18 Finished Date: 3/11/21
Description: Replae approx' 8,504 LF of WM in the Colonial Manor development. Installation of new WM within the ROW, installation of new service connections, relocation of existing meters to be installed in new meter boxes, removal of existing meter boxes, installation of new service laterals, installation of fire hydrants, and grouting in place existing water mains (4" and greater only). Surveys, maintenance of traffic, sodding and site restoration.
Contact Name: Robert Dickson, P.E. Phone: 407 629 6900
Email: rdickson@govmserv.com Within Budget: YES ☒ X NO ☐ *Explain

REFERENCES –FOR CURRENTLY ACTIVE PROJECTS- ITB 2023-02

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: FGUA (Florida Governmental Utility Authority)
Project Name: 180th Ave Package Plant Abatement Project Amount: $ 706,474.00
Start Date: 8/7/2023 Finished Date: In progress
Description: Work of the Project includes construction of approximately 2,220 liner feet (LF) of 4-inch force main by open trench excavation and 500 linear feet (LF) of force main by horizontal directional drilling (HDD)

Contact Name: Jordan Jayashekaramurthy, CPM GSG Phone: 407 629 6900
Email: jodanjay@govmserv.com Within Budget: YES □ NO □*Explain

Reference 2: Company Name: FGUA (Florida Governmental Utility Authority)
Project Name: Jungle Den Inflow & Infiltration Correction and LS Upg Project Amount: $ 2,582,935.00
Start Date: 6/6/2023 Finished Date: in progress
Description: see following page

Contact Name: Robert Gonzalez, P.E. Phone: 407 425 0452
Email: rgonzalez@cphcorp.com Within Budget: YES X NO □*Explain

Reference 3: Company Name: Pasco County BOCC
Project Name: Pasco Aqua Utility System Improvements Project Amount: $ 3,996,354.14
Start Date: 10/25/22 Finished Date: in progress
Description: see following page

Contact Name: Kurt Heath, P.E. Phone: 813 760 1964
Email: Kurt@stroudengineering.com Within Budget: YES X NO □*Explain

Reference 4: Company Name: City of Casselberry
Project Name: PW 2007 Sausalito FM Replacement Project Amount: $ 1,501,270.90
Start Date: 6/27/22 Finished Date: in progress
Description: Install approx 6,000 LF of 10-inch FM consisting of; Repair sidewalk, driveway and asphalt road; Coordinate with City to re-direct flow from existing lift stations (open and closing valves), in order to have existing FM without flow; Restoration of site landscaping, irrigation, roadway and other affected facilities; Connection to existing Lift Station piping and existing Force Main on South Winter Park Drive;
Contact Name: Stefano Ceriana Phone: 407 917 5697
Email: sceriana@chacompanies.com Within Budget: YES X NO □*Explain

Ref #2
- Relocate LS 01: One (1) 8 ft dia. wet well with dual pumps, valves above ground, new electrical panel and generator on-site. Connect gravity sewer and force main: one (1) MH, approx 446 LF of 8-inch PVC gravity main and approx 56 LF of 4-inch PVC force main to be connected to 6-inch PVC at the WWTF Headworks.
- Relocate LS 02: One (1) 6 ft dia. wet well with dual pumps, valves above ground, new electrical panel. Connect gravity sewer and force main: two (2) MHs, approx 225 LF of 8-inch PVC gravity main, approx 25 LF of 4-inch PVC force main and extend approx 60 LF of 6-inch PVC lateral for Condominiums to the new MH.
- Repair and replace gravity sewer: At Jungle Den Villas Condominiums install approx 279 LF of 8-inch PVC gravity main and add one (1) MH to relocate the gravity sewer into the existing utility easement. On Juno Trail Road, Alice Drive and River Road line and repair approx 3,000 LF of gravity

Ref #3
At the Jasmine Lakes community, installation of a new sewer conveyance and pumping system, including a new duplex lift station, 710 linear feet of 6-inch diameter PVC force main piping, and 470 linear feet of 8-inch diameter PVC force main piping by open cut methods. The force main piping work requires the removal of abandoned utility piping, including 900 linear feet of 12-inch diameter PVC piping and 800 linear feet of 8-inch diameter asbestos cement piping. Upon completion and activation of the new pumping system, the existing wastewater treatment facility shall be abandoned and demolished. The work shall also include installation of a new primary and secondary potable water connection for the community, including 690 linear feet of 8-inch diameter PVC water main piping by open cut methods and two (2) aboveground meter and control valve assemblies. At the Palm Terrace community, installation of a new gravity sewer collection and pumping system, including 250 linear feet of gravity sewer piping, four (4) manholes, a new duplex lift station, 1,710 linear feet of 6-inch diameter PVC force main piping by open cut methods, and 2,140 linear feet of 6-inch diameter HDPE force main piping by horizontal directional drilling methods along Ranch Road, with three (3) separate drill lengths. Upon completion and activation of the new pumping system, the existing wastewater treatment facility shall be abandoned and demolished. The work shall also include installation of a new secondary potable water connection for the community, including 140 linear feet of 6-inch diameter PVC water main piping and an aboveground meter and control valve assembly. At the Zephyr Shores community, installation of a new primary and secondary potable water connection for the community, including 200 linear feet of 6-inch diameter PVC water main piping, 120 linear feet of 8-inch diameter PVC water main piping, 50 linear feet of 16-inch diameter steel casing by jacking and boring methods, an aboveground meter and backflow prevention assembly, and an aboveground meter and control valve assembly

REFERENCES –FOR CURRENTLY ACTIVE PROJECTS- ITB 2023-02

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: American Beach Water and Sewer District
Project Name: Well and Septic Tank Phase Out Program Project Amount: $ 7,831,538.00
Start Date: _____ Finished Date: _____
Description: The project includes the installation of approximately 12,400 linear feet of 8" PVC gravity pipe within the existing American Beach community via open-cut installation. (additional information at the bottom of page)

Contact Name: Teresa Irby-Butler, P.E. Phone: 407 629 6900
Email: teresa.irby-butler@fgua.com Within Budget: YES ☒ X NO ☐*Explain

Reference 2: Company Name: _____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date: _____
Description: _____

Contact Name: _____ Phone: _____
Email: _____ Within Budget: YES ☐ NO ☐*Explain

Reference 3: Company Name: _____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date: _____
Description: _____

Contact Name: _____ Phone: _____
Email: _____ Within Budget: YES ☐ NO ☐*Explain

Reference 4: Company Name: _____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date: _____
Description: _____

Contact Name: _____ Phone: _____
Email: _____ Within Budget: YES ☐ NO ☐*Explain

A. The project includes the installation of approximately 12,400 linear feet of 8" PVC gravity pipe within the existing American Beach community via open-cut installation. The open cut will occur in the center of each roadway as identified in the contract drawings. Installation of the gravity sewer system includes the installation of approximately 42 precast concrete manholes, pipe fittings, and sewer laterals to the edge of the right of way. Manhole interior and exterior surfaces shall be coated per JEA standards.
B. The proposed gravity sewer system includes the installation of two new lift stations. Each lift station shall be equipped with submersible pumps, control panels, level control, and mission communications as identified in the contract drawings. The lift station wet wells shall be coated and lined per JEA standards.
C. The proposed sewer system includes approximately 2,600 linear feet of 4-inch PVC force main and associated appurtenances as shown on the contract drawings. All materials and protective linings and coatings for corrosion protection shall abide by JEA standards.
D. Sewer service laterals shall be provided to the parcels shown on the contract drawings. Installation of sewer service laterals shall be within the public right-of-way and shall terminate at the private property lines with above grade, visible demarcation per JEA standard details.
E. The proposed potable water main system includes the installation of approximately 12,300 linear feet new PVC pipe via open-cut installation. Pipe diameters will be 4-inch, 6-inch, and 8-inch as shown on the contract drawings. Installation of the potable water main system includes approximately 16 fire hydrants, approximately 287 service laterals, water meter boxes at all occupied parcels, and water main isolation valves and boxes.
F. Contractor shall be responsible for the relocation of gopher tortoises within the project boundaries and as required by all applicable permits.
G. Roadways shall be resurfaced at the conclusion of the project and to the extent as identified on the contract drawings. Contractor shall be responsible for maintenance of traffic during the entire duration of the project.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion Form- ITB 2023-02

1. The prospective Vendor, U.S. Water Services Corporation, certifies, by submission of this document, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any Federal Department or Agency.

2. Where the Vendor is unable to certify to the above statement, the prospective Vendor shall attach an explanation to this form.

Vendor: U.S. Water Services Corporation
Name of Company – Please Print

Signature:
Authorized Company Representative

Name/Title: Gary Deremer, President

Address: U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652
State of Incorporation: Florida

Date: January 12, 2024

CERTIFICATION OF CONTRACTOR REGARDING TRENCH SAFETY- ITB 2023-02

This certification is required pursuant to the Trench Safety Act, Chapter 90-98, Florida Statutes regarding Trench Safety. The Act specifically incorporates the Occupational Safety and Health Administration's excavation safety standards, 29 CFR S. 1928.650 Subpart P as the State standard. Any revision to OSHA's safety standards that are consistent with the Florida Statues shall also be complied with upon its effective date. The act requires that any bidder or prospective contractor, or any of their proposed subcontractors, shall provide written assurance that the contractor will comply with the applicable trench safety standards.

Name of Contractor: U.S. Water Services Corporation

Address: 4939 Cross Bayou Blvd.,
New Port Richey FL 34652

Phone: 727 848 8292

1. Contractor agrees that he is aware of the Trench Safety Act and the requirements of the Act.
2. Contractors agrees to comply with all applicable trench safety standards as set forth in the Act and as referenced in the Act.

Name of Signer: Gary Deremer
PLEASE PRINT

Title: President

Signature:

Date: January 12, 2024

U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652
State of Incorporation: Florida

BID RESPONSE FORM

Detailed Bid Form to be Submitted on Page 6, Technical Specifications

In accordance with the Specifications contained herein, I certify that any and all information contained in this bid response is true; and I further certify that this bid is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a bid for the same materials, supplies, equipment, or services and is in all respects fair and without collusion or fraud. I agree to abide by all terms and conditions of the bid, and certify that I am authorized to sign for the applicant firm. *Please print the following and sign your name.*

Amount of Base Bid	$ 2,283,625.84
10% Contingency *Contingency is not guaranteed.*	$ 228,362.58
Total Contract Sum (Amount of Bid + Contingency)	$ 2,511,988.42

Any contingency items shall be communicated by written change order and shall be approved by both the Owner and Contractor.

Total Contract Sum of Bid in Words: TWO MILLION FIVE HUNDRED ELEVEN THOUSAND NINE HUNDRED EIGHTY-EIGHT AND FORTY-TWO HUNDREDTHS

The **BIDDER** must submit a bid on all items contained in specification or the bid shall be considered irregular. The **OWNER** reserves the right to accept or reject the bid. The **OWNER**, or his representative, further reserves the unqualified right to determine whether any particular item or items or materials, equipment, or whatsoever is an approved equal, and reserves the unqualified right to a final decision regarding the approval or rejection of the same. The bid selection shall be based on the apparent low bidder for the **"TOTAL CONTRACT SUM"**.

Add'l Documents Included:

- [X] **Bid Form**
- [X] **Bid Bond/Check**
- [X] **References**
- [X] **Public Entity Crimes**
- [X] **License(s) copies**
- [X] **Drug Free Workplace**
- [ ] **No-Bid**
- [X] **Page 22, Signature/Seal**
- [X] **Addenda Affidavit**
- [X] **E-Verify**
- [X] **Non Collusive**
- [X] **Certification re: Debarment, Suspension, Ineligibility & Voluntary Exclusion**

NAME, ADDRESS, AND SIGNATURE OF BIDDER:

NAME: Gary Deremer **TITLE:** President

ADDRESS: 4939 Cross Bayou Blvd., New Port Richey FL 34652

PHONE: 727 848 8292 **FAX:** 727 842 6412

E-MAIL ADDRESS: CCREGO@USWATERCORP.NET

BIDDER SIGNATURE: _____ **DATE:** January 12, 2024

Corporate Seal or Notarization below date

Water Services Corporation CORPORATE SEAL 2003 FLORIDA U.S.

BID REQUIREMENTS

CITY OF ZEPHYRHILLS

Northside Phase 3 Force Main/Water Line Extension

CONSTRUCTION ITEMIZED PRICING SHEET

Item No.	Item Description	Qty.	Unit	Unit Price	Amount
BASE BID					
1	Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions	1	LS	$107,676.00	$107,676.00
2	Traffic Control	1	LS	$25,000.00	$25,000.00
3	Environmental Protection	1	LS	$125,555.00	$125,555.00
4	Construction Survey and Layout	1	LS	$34,500.00	$34,500.00
5	6-Inch Sanitary Sewer Force Main via Open-Cut	9,350	LF	$57.00	$532,950.00
6	6-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	3,400	LF	$45.00	$153,000.00
7	8-Inch Sanitary Sewer Force Main via Open-Cut	4,874	LF	$69.00	$336,306.00
8	8-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	250	LF	$66.00	$16,500.00
9	12-Inch Potable Water Main via Open-Cut	4,525	LF	$105.00	$475,125.00
10	Combination Air/Vacuum Valves and Vaults	14	EA	$4,582.06	$64,148.84
11	Concrete Restoration	2,150	SY	$150.00	$322,500.00
12	Limerock Restoration	406	SY	$35.00	$14,210.00
13	Asphalt Concrete Restoration	1,033	SY	$35.00	$36,155.00
14	Testing Allowance	1	AL	25,000.00	$25,000.00
15	Record/As-Built Drawings Allowance	1	AL	15,000.00	$15,000.00
	TOTAL BID PRICE	2,283,625.84			

AGENCY:
CITY OF ZEPHYRHILLS
ATTN: PURCHASING DEPT
5335 8TH STREET
ZEPHYRHILLS, FL 33542

INVITATION TO BID

Response Acknowledgement

PURCHASING AGENT: Karen Miller
Phone: 813-780-0000 x3536
Email: kmiller@ci.zephyrhills.fl.us

AN EQUAL OPPORTUNITY EMPLOYER

FLORIDA TAX EXEMPT #85-8012740166C-4
FEDERAL IDENTIFICATION NUMBER #59-6000455

Obtained ALL Bid Documents and Submit Q&A and Responses electronically on: OPENGOV - LINK ON WEBSITE WWW.CI.ZEPHYRHILLS.FL.US

BID/PROPOSAL NUMBER	DISTRIBUTION DATE	BID/PROPOSAL TITLE	BID/PROPOSAL RESPONSES OPENING DATE/TIME
ITB-2023-02	11/20/2023	Northside Water/Wastewater Forcemain-Phase 3	OPENGOV Online- Friday, January 12, 2024 before 10 AM

TELE CONFERENCE DATE GoTo Meetng ☒ Strongly Recommended ☐ None
DATE: 12-4-2023 **TIME:** 10:00 AM 2nd Floor Conference Room
GoTo LINK: https://meet.goto.com/159259221
Call: 1-224-501-3412 **ACCESS CODE: 159-259-221**

RESPONSES RECEIVED AFTER ABOVE DATE AND TIME WILL NOT BE ACCEPTED
Bid Bonds must be received

SITE VISIT: After the Meeting

VENDOR MUST COMPLETE THE BELOW AREAS AND RETURN FORM, NOTARIZED. FORM IS REQUIRED.

RESPONDER'S NAME/ADDRESS:
U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652

If returning as a "NO" state reason:

TELPHONE NUMBER: 727 848 8292

EMAIL ADDRESS: CCREGO@USWATERCORP.NET

I certify this Response is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a Response for the same materials, supplies or equipment, and is in all respects fair and without collusion or fraud. I agree to all conditions of this Bid/Proposal and certify that I am authorized to sign this Response for the company. In submitting a Response to the City of Zephyrhills the Responder offers and agrees that if this Response is accepted, the Company will convey, sell, assign or transfer to the City of Zephyrhills all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the Anti-trust laws of the United States and the State of Florida for price fixing relating to the particular commodities or services purchased or acquired by the City of Zephyrills. At the City's discretion, such assignment shall be made and become effective at the time the City tenders final payment to the Company.

FEDERAL EMPLOYER ID NUMBER OR SS NUMBER:
20-0008821

X

AUTHORIZED SIGNATURE

Gary Deremer, President

PRINTED NAME/TITLE

THIS FORM MUST BE NOTARIZED BELOW

Sworn to and subscribed to me this 12th day of January, 2024
Personally known: ☑ Or produced identification: ☐
Type of ID: _____

Christina R. Arego — Florida
Notary Signature — State

My commission expires: January 26, 2025

AFFIX NOTARY STAMP BELOW

NOTARY PUBLIC STATE OF FLORIDA
CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

BONDS

An EBond shall be included in your uploaded response or a certified check delivered to City Hall before the deadline for an amount not less than five (5%) of the total bid price and shall be made payable to the City as a guarantee that the Bidder will not withdraw his bid for a period of forty-five (45) days after bid closing time. Bid, Payment and Performance Bond and all Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

THE CITY OF ZEPHYRHILLS RESERVES THE RIGHT TO REJECT ANY OR ALL PROPOSALS, TO WAIVE INFORMALITIES, AND TO ACCEPT ALL OR ANY PART OF ANY RESPONSE/PROPOSAL AS MAY BE DEEMED TO BE IN THE BEST INTEREST OF THE CITY UNLESS OTHERWISE NOTED, PAYMENT OF GOODS OR SERVICES PROVIDED AS A RESULT OF THIS SOLICITATION WILL BE MADE PER FLORIDA STATUTE. ALL VENDORS MUST SUBMIT A COMPLETED W-9 FORM.

Ron DeSantis, Governor

Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE GENERAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

DELCHER, CECIL R

U S WATER SERVICES CORPORATION
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY FL 34652

LICENSE NUMBER: CGC003307

EXPIRATION DATE: AUGUST 31, 2024

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Ron DeSantis, Governor

Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE UNDERGROUND UTILITY & EXCAVATION CO HEREIN IS CERTIFIED UNDER THE PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

DEREMER, GARY ANDREW

US WATER SERVICES CORPORATION
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY FL 34652

LICENSE NUMBER: CUC1223914

EXPIRATION DATE: AUGUST 31, 2024

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Detail by Entity Name

Florida Profit Corporation
U.S. WATER SERVICES CORPORATION

Filing Information

Document Number	P03000047833
FEI/EIN Number	20-0008821
Date Filed	04/30/2003
Effective Date	04/28/2003
State	FL
Status	ACTIVE
Last Event	AMENDED AND RESTATED ARTICLES
Event Date Filed	03/31/2020
Event Effective Date	NONE

Principal Address

4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Changed: 03/31/2004

Mailing Address

4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Changed: 05/09/2005

Registered Agent Name & Address

DEREMER, GARY A
4939 CROSS BAYOU BOULEVARD

NEW PORT RICHEY, FL 34652

Name Changed: 03/31/2020

Address Changed: 03/31/2020

Officer/Director Detail

Name & Address

Title CEO

DEREMER, GARY
4939 CROSS BAYOU BLVD.
NEW PORT RICHEY, FL 34652

Title VP

DELCHER, CECIL
4939 CROSS BAYOU BLVD.
NEW PORT RICHEY, FL 34652

Title VP

AMIOTT, RALPH
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

KADER, MOHAMMED
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP, Secretary

Mitchell, Edward
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title CFO

RUPE, KAYCEE
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

SALIBA, CHRIS
4939 CROSS BAYOU BOULEVARD

NEW PORT RICHEY, FL 34652

Title VP

RENDELL, WILLIAM TROY
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

DUPONT, JEFFREY
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

VOSS, AARON
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title SVP

Elias, Dan
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title SVP

Jones, Kenneth
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

Benderski, Ron
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

SCHULTZ, DAVID, Jr.
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Annual Reports

Report Year	Filed Date
2021	01/20/2021
2022	01/24/2022

2023	01/11/2023

Document Images

01/11/2023 -- ANNUAL REPORT	View image in PDF format
01/24/2022 -- ANNUAL REPORT	View image in PDF format
01/20/2021 -- ANNUAL REPORT	View image in PDF format
03/31/2020 -- Amended and Restated Articles	View image in PDF format
01/16/2020 -- ANNUAL REPORT	View image in PDF format
09/25/2019 -- Amendment	View image in PDF format
04/04/2019 -- ANNUAL REPORT	View image in PDF format
03/02/2018 -- ANNUAL REPORT	View image in PDF format
04/24/2017 -- ANNUAL REPORT	View image in PDF format
04/15/2016 -- ANNUAL REPORT	View image in PDF format
02/19/2015 -- ANNUAL REPORT	View image in PDF format
02/26/2014 -- ANNUAL REPORT	View image in PDF format
03/18/2013 -- ANNUAL REPORT	View image in PDF format
04/19/2012 -- ANNUAL REPORT	View image in PDF format
04/13/2011 -- ANNUAL REPORT	View image in PDF format
04/02/2010 -- ANNUAL REPORT	View image in PDF format
04/29/2009 -- ANNUAL REPORT	View image in PDF format
03/31/2008 -- ANNUAL REPORT	View image in PDF format
04/30/2007 -- ANNUAL REPORT	View image in PDF format
04/30/2006 -- ANNUAL REPORT	View image in PDF format
05/09/2005 -- ANNUAL REPORT	View image in PDF format
03/31/2004 -- ANNUAL REPORT	View image in PDF format
08/07/2003 -- Amendment	View image in PDF format
06/09/2003 -- Off/Dir Resignation	View image in PDF format
04/30/2003 -- Domestic Profit	View image in PDF format

Previous On List Next On List Return to List

us water services
Search

Events **No Name History**

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

▶ **Go to *www.irs.gov/FormW9* for instructions and the latest information.**

Give Form to the requester. Do not send to the IRS.

Print or type. See **Specific Instructions** on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

U.S. Water Services Corporation

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☑ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

4939 Cross Bayou Boulevard

6 City, state, and ZIP code

New Port Richey, FL 34652

Requester's name and address (optional)

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN,* later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

2	0	–	0	0	8	8	2	1	

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here Signature of U.S. person ▶ Edward Mukeen Date ▶ 02/28/2019

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9.*

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

City Council Meeting
February 26, 2024

Action Item

CONSENT ITEMS 2.4

Approval of Agreement No. 25-24-01 with US Water for the N.E. Sewer Force Main and Water Main

Issue:

This bid is to install approximately 12,500 ft of sewer force main from the intersection of Hwy301 and Kossik, west to Ft. King Rd. then north to Phelps Rd. and south to about Sunshine Rd.
Also, to install approximately 4,100ft of 12" water main from Ft. King Rd. east to the Greenslope and Kossik intersection.

Background:

This part of the overall project will further allow the city to provide water and sewer services to current and future residents of the City and Pasco County.

Attachment(s):

1. 30376393v2 - Contract for Construction - US Water - Northside Water and Wastewater Force Main Phase 3 Project 25-24-01
2. 25-24-01 Exhibit A Northside Water Force Main
3. 25-24-01 Exhibit B Northside Water Force Main
4. 25-24-01 Exhibit C Northside Water Force Main
5. 25-24-01 Exhibit D Northside Water Force Main
6. 25-24-01 Exhibit E Northside Water Force Main

Fiscal Impact:

The City received 10 bids on the project with a range of $2,511,998.42 to 5,565,927.00.
The cost estimate provided in the bid was $4.5 million. The low bid came back as $2,511,988.42, which includes a 10% contingency allowance.

Staff Recommendation:

Staff recommends to the City Council to approve the contract as presented

CITY OF ZEPHYRHILLS CONTRACT 25-24-01
NORTHSIDE LIFT STATION WATER/WASTEWATER FORCE MAIN PHASE 3

THIS CONSTRUCTION AGREEMENT ("Agreement") is made and entered into this **26th** day of **February, 2024** by and between the **CITY OF ZEPHYRHILLS**, a Florida municipal corporation, having its principal office at 5335 8th Street, Zephyrhills, FL 33542 ("City") and **US WATER SERVICES CORPORATION,** a Florida corporation organized and authorized to do business in the State of Florida, having its principal office at 4939 Cross Bayou Boulevard, New Port Richey, FL 34652 ("Contractor"). The City and Contractor shall collectively be referred to as the "Parties", and each may individually be referred to as a "Party".

ARTICLE 1 – RECITALS

1.1 The recitals are true and correct and are hereby incorporated into and made a part of this Agreement.

ARTICLE 2 – CONTRACT DOCUMENTS

2.1 The following documents, collectively referred to as the "Contract Documents", are incorporated into and made part of this Agreement:

2.1.1 City Bid ITB 2023-02, Northside Lift Station - Water/Wastewater Force Main – Phase 3 "**Exhibit A**".

2.1.2 City Bid ITB 2023-02 Technical Specifications **"Exhibit B"**.

2.1.3 City Bid ITB 2023-02 Plans **"Exhibit C"**.

2.1.4 City Bid ITB 2023-02 Addendums **"Exhibit "D"**.

2.1.3 Contractor's response to Item 2.1.1, attached hereto as "**Exhibit E**".

ARTICLE 3 – TERM OF AGREEMENT

3.1 Subject to authorized adjustments, the Term of this Agreement shall be up to a maximum of **Four Hundred Sixty (460)** calendar days from Notice to Proceed. During the pre-project meeting the awardee will provide the Owner the number of weeks which will take for the equipment to be delivered. Once delivered a Notice to Proceed will be issued which will start the 365 calendar days.

3.3 When, in the opinion of the City, reasonable grounds for uncertainty exist with respect to the Contractor's ability to perform Services or any portion thereof, the City may request that the Contractor, within a reasonable time frame set forth in the City's request, provide adequate assurances to the City in writing, of Contractor's ability to perform in accordance with terms of this Agreement. In the event that the Contractor fails to provide the City the requested assurances within the prescribed time frame, the City may treat such failure as a repudiation or breach of the Agreement, and resort to any remedy for breach provided for in this Agreement or at law.

ARTICLE 4 – COMPENSATION

4.1 Contract is awarded to a maximum of **$2,511,988.42 (includes $228,362.58 contingency)**. Compensation for services shall be as per outlined in Contractors response, attached as Exhibit "E". The City will be processing payments via ACH/EFT. (See Forms)

4.2 The City shall pay Contractor within forty-five (45) days of receipt of invoice the total shown to be due on such invoice, provided the City has accepted the Services.

ARTICLE 5 – SCOPE OF SERVICES

5.1 Contractor shall provide all labor, supervision, materials, equipment, tools, services, monitoring and expertise necessary for the completion of Services, in accordance with the specifications, terms and conditions contained in the Contract Documents. Contractor shall perform the Services in accordance with that degree of care and skill ordinarily exercised by reputable members of its profession.

5.2 This contract has been enhanced to include other City services as required, i.e., storm water or other related public works projects as awarded by the City Council.

5.3 Contractor represents and warrants to the City that: (i) Contractor possesses all qualifications, licenses and expertise required for the provision of Services, with personnel fully licensed by the State of Florida; (ii) Contractor is not delinquent in the payment of any sums due the City, including payment of permit fees, local business taxes, or in the performance of any obligations to the City; (iii) All personnel assigned to perform work shall be, at all times during the term hereof, fully qualified and trained to perform the tasks assigned to each; (iv) the Services will be performed in the manner and at such times and locations as described by the City for the budgeted amount; and (v) The person executing this Agreement on behalf of the Contractor is duly authorized to execute same and fully bind Contractor as a party to this Agreement.

5.4 **Contractor shall not subcontract part(s) of the work, the aggregate cost of which is greater than 50 percent of the contract price, without prior written approval by Owner**. Contractor shall cause appropriate provisions to be inserted in each subcontract making the Owner and Engineer a third party beneficiary of such subcontract and to give Contractor the same power as regards terminating any subcontract that Owner may exercise over Contractor under any provision of the Contract Documents. Each Subcontractor shall discharge all duties and responsibilities of Contractor to Owner covered by his subcontract.

5.5 Contractor warrants that any and all work, materials, services or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result, will be supplied by the Contractor at its own cost, whether or not specifically called for.

5.6 The Services shall be completed by the Contractor to the satisfaction of the City. The City shall make decisions on all claims regarding interpretation of the Agreement and on all other matters relating to the execution, progress and quality of the Services.

ARTICLE 6 – CITY'S TERMINATION RIGHTS

6.1 The City shall have the right to terminate this Agreement, in its sole discretion at any time, with or without cause, upon fifteen (15) days written notice to Contractor. In such event, the City shall pay Contractor compensation for Services rendered prior to the effective date of termination. The City shall not be liable to Contractor for any additional compensation, or for any consequential or incidental damages.

ARTICLE 7 – INDEPENDENT CONTRACTOR

7.1 Contractor has been procured and is being engaged by the City as an independent contractor, and not as an agent or employee of the City. Accordingly, Contractor shall not attain, not be entitled to, any rights or benefits under the Ordinances of the City, nor any rights generally afforded classified or unclassified employees of the City.

Contractor further understands that Florida workers' compensation benefits available to employees of the City, are not available to Contractor. Therefore, Contractor agrees to provide workers' compensation insurance for any employee or agent of Contractor rendering services to the City under this Agreement.

ARTICLE 8 – CONFLICTS OF INTEREST

8.1 The Contractor represents and warrants to the City that it has not employed or retained any person or company employed by the City to solicit or secure this Agreement and that it has not offered to pay, paid, or agreed to pay any person any fee, commission, percentage, brokerage fee, or gift of any kind contingent upon or in connection with, the award of this Agreement.

8.2 Contractor covenants that no person under its employ who presently exercises any functions or responsibilities on behalf of the City in connection with this Agreement has any personal financial interest, directly or indirectly with Contractor. Contractor further covenants that, in the performance of this Agreement, no person having such conflicting interest shall be employed.

ARTICLE 9 – DEFAULT

9.1 If Contractor fails to comply with any term or condition of this Agreement, or fails to perform any of its obligation hereunder, then Contractor shall be in default. The City shall have the right to terminate this Agreement, in the event Contractor fails to cure a default within ten (10) business days after receiving Notice of Default. Contractor understands and agrees that termination of this Agreement under this section shall not release Contractor from any obligations accruing prior to the effective date of termination.

ARTICLE 10 – NOTICES

10.1 All notices, demands, correspondence and communication between the City and Contractor shall be deemed sufficiently given under the terms of this Agreement when delivered by personal service, faxed, or dispatched by mail or certified mail, addressed as follows:

To CONTRACTOR:

US Water Services Corporation
Attn: Christina Crego
4939 Cross Bayou Boulevard
New Port Richey, FL 34652
ccrego@uswatercorp.net

To CITY:

City of Zephyrhills
ATTN: William C. Poe, Jr., City Manager
5335 8th Street
Zephyrhills, Florida 33542
wpoe@ci.zephyrhills.fl.us

And,

City of Zephyrhills
ATTN: Matthew E. Maggard, City Attorney
5335 8th Street
Zephyrhills, Florida 33542
mmaggard@ci.zephyrhills.fl.us

10.2 Either Party may at any time designate a different address and/or contact person by giving notice as provided above to the other Party. Such notices shall be deemed given upon receipt by the addressee.

10.3 In the event there is a change of address and the moving Party fails to provide notice to the other Party, then notice sent as provided in this Article shall constitute adequate notice.

ARTICLE 11 – PUBLIC RECORDS

11.1 **IF THE CONSULTANT/CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONSULTANT'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT 813-780-0000, EXT. 3543 OR CITYCLERK@CI.ZEPHYRHILLS.FL.US OR CITY CLERK, CITY OF ZEPHYRHILLS, 5335 EIGHTH STREET, ZEPHYRHILLS, FLORIDA 33542.**

ARTICLE 12 – INDEMNIFICATION

12.1 Contractor shall defend, indemnify and hold harmless the City of Zephyrhills and all of the City of Zephyrhills's officers, agents, and employees from and against all claims, liability, loss and expense, including reasonable costs, collection expenses, attorneys' fees, and court costs which may arise because of the negligence (whether active or passive), misconduct, or other fault, in whole or in part (whether joint, concurrent, or contributing), of Contractor, its officers, agents or employees in performance or non-performance of its obligations under the Agreement. Contractor recognizes the

broad nature of this indemnification and hold harmless clause, as well as the provision of a legal defense to the City of Zephyrhills when necessary, and voluntarily makes this covenant and expressly acknowledges the receipt of such good and valuable consideration provided by the City of Zephyrhills in support of these indemnification, legal defense and hold harmless contractual obligations in accordance with the laws of the State of Florida. This clause shall survive the termination of this Agreement. Compliance with any insurance requirements required elsewhere within this Agreement shall not relieve Contractor of its liability and obligation to defend, hold harmless and indemnify the City of Zephyrhills as set forth in this article of the Agreement.

Nothing herein shall be construed to extend the City of Zephyrhills's liability beyond that provided in section 768.28, Florida Statutes.

ARTICLE 13 – INSURANCE

13.1 Contractor shall, at its sole cost and expense, procure and maintain throughout the term of this contract, Comprehensive General Liability and Worker's Compensation insurance, including Employer Liability insurance, with minimum policy limits of $ 1,000,000 (this could be $2,000,000 depending on the amount of the contract) Combined Single Limits, or to the extent and in such amounts as required and authorized by Florida law, and will provide endorsed certificates of insurance generated and executed by a licensed insurance broker, brokerage or similar licensed insurance professional evidencing such coverage, and naming the City of Zephyrhills as a named, additional insured, as well as furnishing the City of Zephyrhills with a certified copy, or copies, of said insurance policies. Certificates of insurance and certified copies of these insurance policies must accompany this signed contract. Said insurance coverages procured by Contractor as required herein shall be considered, and Contractor agrees that said insurance coverages it procures as required herein shall be considered, as primary insurance over and above any other insurance, or self–insurance, available to the City of Zephyrhills, and that any other insurance, or self-insurance available to the City of Zephyrhills shall be considered secondary to, or in excess of, the insurance coverage(s) procured by Contractor as required herein.

Nothing herein shall be construed to extend the City of Zephyrhills's liability beyond that provided in section 768.28, Florida Statutes.

13.2 If this Contract includes: (1) construction of a new above-ground structure or structures, or (2) any addition(s), improvement(s), alteration(s), or repair(s), to an existing above-ground structure or structures, or (3) the installation of machinery or equipment into an existing structure or structures, the Contractor shall provide, in a policy acceptable to the City, "all risk" (i.e. Special Form) property insurance on any such construction, additions, machinery or equipment. The amount of the insurance shall be no less than the estimated replacement value at the time of the City's final acceptance of such new structures, addition(s), improvement(s), alteration(s), repair(s), machinery or equipment. The coverage shall not be subject to any restriction with respect to occupancy or use by the City and, subject to thirty (30) days' prior written notice to the City shall remain in full effect until final acceptance by the City. In addition, the City, the Professional, and the Contractor's subcontractors of any tier, shall be additional insureds on this policy. The insurance shall include a deductible no greater than one percent (1%) of the Contract amount, or $25,000, whichever is smaller, for which the Contractor shall be responsible. The risk of loss whether insured or not shall remain with the

Contractor until final acceptance. Upon request, Contractor shall furnish to the City complete copies of the insurance policy.

ARTICLE 14 – FORCE MAJEURE

14.1 A "Force Majeure Event" shall mean an act of God, act of governmental body or military authority, fire, explosion, power failure, flood, storm, hurricane, sink hole, other natural disasters, epidemic, riot or civil disturbance, war or terrorism, sabotage, insurrection, blockade, or embargo. In the event that either Party is delayed in the performance of any act or obligation pursuant to or required by the Agreement by reason of a Force Majeure Even, the time for required completion of such act or obligation shall be extended by the number of days equal to the total number of days, if any, that such Party is actually delayed by such Force Majeure Event.

The Party seeking delay in performance shall give notice to the other Party specifying the anticipated duration of the delay, and if such delay shall extend beyond the duration specified in such notice, additional notice shall be repeated no less than monthly so long as such delay due to a Force Majeure Event continues. Any Party seeking delay in performance due to a Force Majeure Event shall use its best efforts to rectify any condition causing such delay and shall cooperate with the other Party to overcome any delay that has resulted.

ARTICLE 15 – CHANGE ORDERS

15.1 Without invalidating the Agreement, the City may, at any time or from time to time, order additions, deletions, or revisions in the work authorized by an executed, signed Change Order. Change Orders should be submitted to the City for review and shall incorporate all unchanged terms. Change Orders are a defined written instrument using AIA Document G701-2017 and be prepared by the Contractor and signed by both Contractor and authorized City representative.

Upon receipt of an executed authorized Change Order, the Contractor shall proceed with the work involved. All such work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment will be made.

The Department Director may authorize changes or alterations in the work not involving extra cost and not inconsistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order. If any minor change or alteration will result in an increase in the Contract Price, the Contractor must submit the proposed change to the City in writing, in the form of a change order.

The Contractor shall not start work on any alteration requiring an increase or decrease in price or extension of time until a Change Order setting forth the adjustments is executed by the City.

It is the Contractor's responsibility to notify his Surety of any changes affecting the general scope of the work or change in the Contract Price and the amount of the applicable Bonds shall be adjusted accordingly. The Contractor shall furnish proof of such adjustment to the City prior to performing work as outlined in the change order.

ARTICLE 16 – MISCELLANEOUS PROVISIONS

16.1 No waiver or breach of any provision of this Agreement shall constitute a waiver of any subsequent breach of the same or any other provision hereof, and no waiver shall be effective unless made in writing.

16.2 All representations, indemnifications, warranties and guarantees made in, required by, or given in accordance with this Agreement, as well as all continuing obligations indicated in the Contract Documents, shall survive final payment, completion and acceptance of the Services and termination or completion of the Agreement.

16.3 Should any provision, paragraph, sentence, word or phrase contained in this Agreement be determined by a court of competent jurisdiction to be invalid, illegal or otherwise unenforceable under the laws of the State of Florida, such provision, paragraph, sentence, word, or phrase shall be deemed modified to the extent necessary in order to confirm with such laws, or if not modifiable, then same shall be deemed severable, and in either event, the remaining terms and provisions of this Agreement shall remain unmodified and in full force and effect or limitation of its use.

16.4 The City is exempt from Federal Excise and State taxes. The applicable tax exemption number or certificate shall be made available upon request.

16.5 This Agreement constitutes the sole and entire agreement between the Parties. No modification or amendments hereto shall be binding on either Party unless in writing and signed by both Parties.

16.6 This Agreement shall be construed and enforced according to the laws of the State of Florida. Venue in any proceedings between the Parties shall be in Pasco County, Florida.

16.7 The City reserves the right to audit the records of the Contractor covered by this Agreement at any time during the provision of Services and for a period of three (3) years after final payment is made under this Agreement.

16.8 The Contractor agrees that it shall not discriminate as to race, sex, color, creed, national origin, or disability, in connection with its performance under this Agreement.

16.9 The professional services to be provided by Contractor pursuant to this Agreement shall be non-exclusive, and nothing herein shall preclude the City from engaging other firms to perform Services.

16.10 This Agreement shall be biding upon the Parties herein, their heirs, executors, legal representatives, successors and assigns.

16.11 The Contractor agrees to comply with and observe all applicable federal, state, and local laws, rules, regulations, codes and ordinances, as they may be amended from time to time.

16.12 All other terms and conditions set forth in the Contract Documents which have not been modified by this Agreement, shall remain in full force and effect.

16.13 In the event of any dispute arising under or related to this Agreement, the prevailing Party shall be entitled to recover all actual attorney fees, costs and expenses incurred by it in connection with that dispute and/or the enforcement of this Agreement, including all such actual attorney fees, costs and expenses at all judicial levels, including appeal, until such dispute is resolved with finality.

16.14 This Agreement may be executed in two or more counterparts, each of which shall constitute an original but all of which, when taken together, shall constitute one and the same Agreement.

IN WITNESS WHEREOF, the parties have executed this agreement on the day written above.

CITY OF ZEPHYRHILLS

_____
Lance A. Smith, Council President

Attest: _____
Lori L. Hillman, City Clerk

Signed, Sealed and Delivered
In the presence of:

US WATER SERVICES CORPORATION

_____
Witness

By: _____
Name: _____
Its: _____

_____
Witness

AGENCY:		INVITATION TO BID
CITY OF ZEPHYRHILLS ATTN: PURCHASING DEPT 5335 8TH STREET ZEPHYRHILLS, FL 33542	Zephyrhills jump right in.	Response Acknowledgement

PURCHASING AGENT: Karen Miller	AN EQUAL OPPORTUNITY EMPLOYER	
Phone: 813-780-0000 x3536	FLORIDA TAX EXEMPT	#85-8012740166C-4
Email: kmiller@ci.zephyrhills.fl.us	FEDERAL IDENTIFICATION NUMBER	#59-6000455

Obtained ALL Bid Documents and Submit Q&A and Responses electronically on: OPENGOV - LINK ON WEBSITE WWW.CI.ZEPHYRHILLS.FL.US

BID/PROPOSAL NUMBER	DISTRIBUTION DATE	BID/PROPOSAL TITLE	BID/PROPOSAL RESPONSES OPENING DATE/TIME
ITB-2023-02	11/20/2023	Northside Water/Wastewater Forcemain-Phase 3	OPENGOV Online- Friday, January 12, 2024 before 10 AM

TELE CONFERENCE DATE GoTo Meetng ☒ Strongly Recommended ☐ None DATE: 12-4-2023 TIME: 10:00 AM 2nd Floor Conference Room GoTo LINK: https://meet.goto.com/159259221 Call: 1-224-501-3412 ACCESS CODE: 159-259-221	RESPONSES RECEIVED AFTER ABOVE DATE AND TIME WILL NOT BE ACCEPTED Bid Bonds must be received

SITE VISIT: After the Meeting

VENDOR MUST COMPLETE THE BELOW AREAS AND RETURN FORM, NOTARIZED. FORM IS REQUIRED.

RESPONDER'S NAME/ADDRESS:	If returning as a "NO" state reason:
TELPHONE NUMBER:	
EMAIL ADDRESS:	

I certify this Response is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a Response for the same materials, supplies or equipment, and is in all respects fair and without collusion or fraud. I agree to all conditions of this Bid/Proposal and certify that I am authorized to sign this Response for the company. In submitting a Response to the City of Zephyrhills the Responder offers and agrees that if this Response is accepted, the Company will convey, sell, assign or transfer to the City of Zephyrhills all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the Anti-trust laws of the United States and the State of Florida for price fixing relating to the particular commodities or services purchased or acquired by the City of Zephyrills. At the City's discretion, such assignment shall be made and become effective at the time the City tenders final payment to the Company.

FEDERAL EMPLOYER ID NUMBER OR SS NUMBER:

X

AUTHORIZED SIGNATURE

PRINTED NAME/TITLE

THIS FORM MUST BE NOTARIZED BELOW

Sworn to and subscribed to me this ___ day of _____, 2024

Personally known: ☐ Or produced identification: ☐

Type of ID: _____

_____ _____

Notary Signature State

My commission expires: _____

AFFIX NOTARY STAMP BELOW

BONDS

An EBond shall be included in your uploaded response or a certified check delivered to City Hall before the deadline for an amount not less than five (5%) of the total bid price and shall be made payable to the City as a guarantee that the Bidder will not withdraw his bid for a period of forty-five (45) days after bid closing time. Bid, Payment and Performance Bond and all Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

THE CITY OF ZEPHYRHILLS RESERVES THE RIGHT TO REJECT ANY OR ALL PROPOSALS, TO WAIVE INFORMALITIES, AND TO ACCEPT ALL OR ANY PART OF ANY RESPONSE/PROPOSAL AS MAY BE DEEMED TO BE IN THE BEST INTEREST OF THE CITY UNLESS OTHERWISE NOTED, PAYMENT OF GOODS OR SERVICES PROVIDED AS A RESULT OF THIS SOLICITATION WILL BE MADE PER FLORIDA STATUTE. ALL VENDORS MUST SUBMIT A COMPLETED W-9 FORM.

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BID RESPONSE FORM

Detailed Bid Form to be Submitted on Page 6, Technical Specifications

In accordance with the Specifications contained herein, I certify that any and all information contained in this bid response is true; and I further certify that this bid is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a bid for the same materials, supplies, equipment, or services and is in all respects fair and without collusion or fraud. I agree to abide by all terms and conditions of the bid, and certify that I am authorized to sign for the applicant firm. *Please print the following and sign your name.*

Amount of Base Bid	$ _____
10% Contingency *Contingency is not guaranteed.*	$ _____
Total Contract Sum (Amount of Bid + Contingency)	$ _____

Any contingency items shall be communicated by written change order and shall be approved by both the Owner and Contractor.

Total Contract Sum of Bid in Words: _____

_____

_____

The **BIDDER** must submit a bid on all items contained in specification or the bid shall be considered irregular. The **OWNER** reserves the right to accept or reject the bid. The **OWNER**, or his representative, further reserves the unqualified right to determine whether any particular item or items or materials, equipment, or whatsoever is an approved equal, and reserves the unqualified right to a final decision regarding the approval or rejection of the same. The bid selection shall be based on the apparent low bidder for the **"TOTAL CONTRACT SUM"**.

Add'l Documents Included:

- ☐ Bid Form
- ☐ Bid Bond/Check
- ☐ References
- ☐ Public Entity Crimes
- ☐ License(s) copies
- ☐ Drug Free Workplace
- ☐ No-Bid
- ☐ Page 22, Signature/Seal
- ☐ Addenda Affidavit
- ☐ E-Verify
- ☐ Non Collusive
- ☐ Certification re: Debarment, Suspension, Ineligibility & Voluntary Exclusion

NAME, ADDRESS, AND SIGNATURE OF BIDDER:

NAME: _____ **TITLE:** _____

ADDRESS: _____

PHONE: _____ **FAX:** _____

E-MAIL ADDRESS: _____

BIDDER SIGNATURE: _____ **DATE:** _____

Corporate Seal or Notarization below date

BID REQUIREMENTS

Bid documents, plans, addendums can be viewed and downloaded from **OPENGOV** at https://www.https://procurement.opengov.com/portal/zephyrhillsfl A link to **OPENGOV** can be found on the City's Website, www.ci.zephyrhills.fl.us, Click on Government, Purchasing, **OPENGOV**, SIGNUP and you will be able to follow our solicitation activity after signup. It is your responsibility to ensure you have downloaded all addendums published before the bid opening. You must be a registered vendor for the City of Zephyrhills. Registration is FREE. Your response and all required documentation are to be **submitted through OPENGOV electronically before the date and time listed for responses**.

Bid Bond: There are two methods of providing your solicitation bid bond. The **first** and preferred method is by an EBond which can be electronically uploaded with your solicitation response. The **second** method is to provide a certified check and deliver it to City Hall, 5335 8th Street, Zephyrhills, Florida 33542 before the deadline. Shall be for an amount not less than five percent (5%) of the total bid price and shall be made payable to the City as a guarantee that the Bidder will not withdraw his bid for a period of forty-five (45) days after bid closing time.

The Bid Bond (EBond or Certified Check) provides as a guarantee that if the bid proposal is accepted, the bidder will executed and execute the contract and furnish a Payment and Performance Bond at least equal to one hundred percent (100%) of the contract price within ten (10) days after Notice of Award of the contract.

The bid package language accommodates for all types of services and/or purchases.

TELE/PRE-CONFERENCE: This tele/pre-conference meeting is non-mandatory but **strongly** recommended to discuss the requirements of this solicitation. This has been scheduled for **Monday, December 4, 2023 at 10:00 AM**. This meeting will assure all bidders share the same information and have a fair opportunity to bid this project. It is recommended all vendors visit the locations to look at the requirements listed in this solicitation.

GoTo Link: **https://meet.goto.com/159259221**
Phone: **+1(224)501-3412**
Access Code: **159-259-221**

You may need to type the link as cutting/pasting may not work.

Payment and Performance Bond and All Insurance Shall be Secured from or Countersigned by an Agency or Surety Company Recognized in Good Standing and Authorized to do Business in the State of Florida. If at any time the Owner for justifiable cause shall be or become dissatisfied with any Surety, then upon the Performance of Payment Bonds, the Contractor/Vendor shall within ten (10) days after notice from the Owner, substitute an acceptable bond (or Bonds) in such form and sum and signed by such other Surety or Sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor/Vendor. No further payments shall be deemed due and shall not be made until new Surety or Sureties shall have furnished such an acceptable bond to the Owner.

Indemnity: Contractor/vendor shall defend, indemnify and hold harmless the City of Zephyrhills and all of the City of Zephyrhills's officers, agents, and employees from and against all claims, liability, loss and expense, including reasonable costs, collection expenses, attorneys' fees, and court costs which may arise because of the negligence (whether active or passive), misconduct, or other fault, in whole or in part (whether joint, concurrent, or contributing), of contractor/vendor, its officers, agents or employees in performance or non-performance of its obligations under the Agreement generated from this solicitation. Contractor/vendor recognizes the broad nature of this indemnification and hold harmless cause, as well as the provision of a legal defense to the City of Zephyrhills when necessary, and voluntarily makes this covenant and expressly acknowledges the receipt of such good and valuable consideration provided by the City of Zephyrhills in support of these indemnification, legal defense and hold harmless contractual obligations in accordance with the laws of the State of Florida. This clause shall survive the

termination of the Agreement from this solicitation. Compliance with any insurance requirements required elsewhere within the Agreement shall not relieve the contractor/vendor of its liability and obligation to defend, hold harmless and indemnify the City of Zephyrhills as set forth in this article of the Agreement.

It is further agreed that liability and exposure for indemnification (including, but not limited to the amounts of any indemnification owed by a governmental entity) will be limited to and governed by the provisions of Section 768.28(5), Florida Statutes.

Exparte Communication: Please note that to insure the proper and fair evaluation of a bid proposal, the City of Zephyrhills prohibits exparte communication (i.e., unsolicited) initiated by a bidder to the City official or employee evaluating or considering the bids prior to the time a bid decision has been made. Any communication between bidder and the City will be initiated by the appropriate City official or employee inorder to obtain information or clarification needed to develop a proper and accurate evaluation of the bid. Any exparte communication may be grounds for disqualifying the offending bidder from consideration or award of the proposal then in evaluation or any future proposal.

INSTRUCTIONS TO BIDDERS

1. ***Proposals***: Responses/Proposals will be submitted through BidNet Direct meeting all requirements listed for furnishing all transportation, labor, material and equipment, and performing all operations required for the construction and completion of the work herein specified and shown on the drawings.

2. ***Additional Information or Clarification***: Request for additional information or clarifications must be made in writing and can be e-mailed to kmiller@ci.zephyrhills.fl.us or through BidNet Direct (preferred). Any request for additional information or clarification must be received in writing **no later than Friday, December 29, 2023 by 10:00 A.M.**

3. ***Equivalent Brand Names***: When the City does not wish to rule out other competitor's brands or makes, the phrase "OR EQUIVALENT" is specified. Whenever a material, article or piece of equipment is identified on the plans or in the specifications by reference to manufactures' or vendors' names, trade names, catalogue numbers, etc, it is intended merely to establish a standard; and, any material, article or equipment of other manufacturers and vendors that will perform adequately the duties imposed by the general design and will be considered equally acceptable provided the material, article or equipment so proposed, is, in the opinion of the Architect/Engineer, of equal substance and function. It shall not be purchased or installed by the Contractor/Vendor without the Architect/Engineer's written approval. However, if a product other than the specified bid, it is the bidder's responsibility to identify such product in its bid, and prove to the City that said product is equal to or better than the product specified. The City shall have the sole and absolute discretion to

   determine whether the product identified by the bidder is equal to or better than the product specified by the City. Manufacturers' certificates of specifications conformance of materials may be required by the City; these certificates shall be furnished at no cost to the City. Unless otherwise specified, evidence in the form of samples may be requested if the proposed brand is other than specified by the City. If samples should be requested, such samples must be received by the City within the time specified after a formal request is made. Any items which fall into this category are to be submitted to the City for review and approval no later **than Friday, December 29, 2023 by 10:00 A.M.**

4. ***Bidder***: A bidder is an individual, firm, or corporation submitting a Proposal to the City for the work contemplated.

5. ***Response Forms***: The bidder shall submit his Proposal on the forms furnished herewith. The blank spaces shall be filled in correctly for each lump sum item and for every item for which a quantity is given. The bidder shall state the price, typewritten or printed in ink, for which he proposes to do each item of work called for.

6. ***Signature on Response***: The bidder must sign his Response correctly. If the response is made by an individual, he shall sign and his name and his post office address shall be shown. If made by a firm or partnership, signature shall be by a general partner and the name and post office address of each member of the firm or partnership shall be shown. If made by a corporation, the person signing the Response shall show the name of the state under the laws of which the corporation was chartered, also the name and business address of its president, secretary and treasurer. The Response shall bear the seal of the corporation attested by the secretary. Anyone signing the Response as agent shall file with the Response legal evidence of his authority to do so.

7. ***Familiarity with Laws***: The bidder is assumed to be familiar with all Federal, State and local laws, ordinances, rules and regulations that in any manner affect the work. Ignorance on the part of the bidder will in no way relieve him from responsibility.

8. ***Examination of Drawings, Specifications and Site of Work***: The bidder shall visit the site of the proposed work and familiarize himself with the nature and extent of the work and all local conditions that may in any manner affect the work to be done and the equipment, materials and labor required. By submitting his bid, the bidder acknowledges that he has visited the site and that he is otherwise familiar with the nature and extent of the work and all local conditions that may in any manner affect the work to be done and the equipment, material and labor required. He is required to examine carefully the drawings and specifications and Form of Agreement and Bond and to inform himself accurately and completely regarding any and all conditions and requirements contained herein that may in any manner affect the work to be performed.

9. ***Qualifications of Bidders***: The contract(s), if awarded, will be awarded only to a responsible contractor/vendor who is qualified by experience to do/supply the work specified herein. The bidder shall submit with his Proposal evidence satisfactory to the City, of his experience in like work and when requested he shall show that he has prepared the necessary organization, capital, equipment and machinery to complete the work to the satisfaction of the City within the time limit stated in the Contract Documents.

10. ***Disqualification of Bidders***: No bidder shall submit more than one proposal, and reasonable grounds for believing that a bidder interested in more than one Proposal for the same work will cause rejection of all Proposals in which such bidder, or bidders, are believed to be interested. Any or all Proposals will be rejected if there is reason to believe that Collusion exists among the bidders and no participants in such collusion will be considered in future Proposals for the same work.

11. ***Right to Reject Submittal Response***: Right is reserved to reject any or all Proposals and to disregard technical errors.

12. ***Return of Guaranty***: As soon as the bids have been compared, the City may, at its discretion, return the guaranty deposit accompanying such Proposals as in its judgment would not likely be considered in making the award. All other proposal guaranties will be held until the Agreement and Bond have been executed, after which they will be returned to the respective bidders.

13. ***Execution of the Agreement***: The individual, firm or corporation to which the contract has been awarded shall sign the necessary Agreement with the City, and return it to the City within **ten (10)** days. No contract shall be considered binding upon the City until it has been properly executed.

14. ***Failure to Execute the Agreement***: Failure on the part of the successful bidder to execute the Agreement as required will be just cause for the annulment of the award, and in the event of the annulment of the award, the Bidder shall forfeit his bid bond. This forfeiture shall not be construed as a penalty, but as reasonable, fixed and liquidated damages because of the Bidder's failure to enter into Agreement with the City. The award may then be made to the next lowest acceptable bidder, or the work re-advertised as the City may elect.

15. ***Withdrawal of Response***: A bidder may withdraw his Proposal without prejudice to himself, not later than the day and hour set for opening of bids, by communicating his purpose in writing to the City and his Proposal will be returned to him unopened.

16. ***Interest of Member of or Delegate to Congress.*** No member of or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this contract or any benefit that may arise therefrom, but this provision shall be construed to extend to this contract if made with a corporation for its general benefit.

17. ***Basis of Award***: Considerations will be given to price, experience of the bidder in this type of work, and their conformity with the specifications. Except where the City exercises the right reserved herein to reject any or all bids and subject to the restrictions stated hereinabove, the Contract shall be awarded by the City to the responsible Bidder who has submitted either the lowest responsive bid, or the lowest responsive bid on the base bid including such alternates/optional items as the City determines to be in its own best interests, and application of any preferences, as applicable. The quality of the material to be supplied, their suitability to requirements, and guarantee clauses shall be taken into consideration. No significant deviation for the term of this specification is acceptable. The City of Zephyrhills reserves the right to reject any or all bids as authorized by law, to accept in whole or in part any such bid, and to award the contract to other than the lowest bidder at its discretion, if the best interest of the City of Zephyrhills is thereby served.

18. ***Award of Contract***: The City reserves the right to reject any or all bids, or any part of any bid, to waive any informality in any bid, or to re-advertise for all or part of the work contemplated. The City reserves the right, prior to award of Contract, to add to the scope of the project any item or any combination of items which may exceed the total bid price for the project.

    Considerations will be given to price, experience of the bidder in this type of work, and their conformity with the specifications. Awards will be made to the lowest responsible bidder. The quality of the material to be supplied, their suitability to requirements, and guarantee clauses shall be taken into consideration. No significant deviation for the term of this specification is acceptable. The City of Zephyrhills reserves the right to reject any or all bids as authorized by law, to accept in whole or in part any such bid, and to award the contract to other than the lowest bidder at its discretion, if the best interest of the City of Zephyrhills is thereby served.

    A pre-construction meeting shall take place after the award of the contract. This meeting is mandatory pre-construction meeting. The attendees of this meeting shall be the Contractor and City Staff.

    In the event the contract is awarded to this Bidder, he will enter into a formal written agreement with the City in accordance with the accepted bid within ten (10) calendar days after said contract is

submitted to him. The Bidder further agrees that in the event of the Bidder's default or breach of any of the agreements of this proposal, the said bid deposit shall be forfeited as liquidated damages.

If awarded this contract, It is hereby understood and mutually agreed, by and between the Contractor/Vendor and the Owner, that the date of beginning and the time for completion as specified in the contract of the work to be done hereunder are ESSENTIAL CONDITIONS of this contract; and it is further mutually understood and agreed that the work embraced in this contract shall be commenced on a date to be specified in the "Notice to Proceed."

It is further agreed where under the contract an additional time is allowed for the completion of any work, the time limit fixed by such extension shall be of the essence of this contract. Provided, that the Contractor/Vendor shall not be charged with liquidated damages or any excess cost when the Owner determines that the Contractor/Vendor is without fault and the Contractor's or Vendor's reason for the time extension is acceptable to the Owner: Provided, further, that the Contractor/Vendor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

(a) To any preference, priority or allocation order duly issued by the Government.
(b) To any delays of Subcontractors or suppliers occasioned by any of the causes specified in subsection (a).

Provided, further, that the Contractor/Vendor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor/Vendor within a reasonable time of its decision in the matter.

The Contractor/Vendor agrees that said work shall be prosecuted regularly, diligently, and uninterrupted at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor/Vendor and the Owner, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality. The Bidder agrees to supply all materials within thirty (30) days after successful agreement has been signed by both parties and after contract has been submitted to them and receipt of Notice to Proceed.

If the said Contractor/Vendor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor/Vendor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner the amount

specified in the contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor/Vendor shall be in default after the time stipulated in the contract for completing the work

Should the contractor/vendor fail to substantially complete and supply the materials listed under this contract and make it available for beneficial use on or before the date stipulated for completion (or such later date as may result from extension of time granted by City), he shall pay the City, as liquidated damages, the sum of **$1000.00** for each consecutive calendar day that terms of the contract remain unfulfilled beyond date allowed by the contract, which sum is agreed upon as a reasonable and proper measure of damages which City will sustain per diem by failure of Contractor/vendor to supply the materials within the time stipulated; it being recognized by City and Contractor/vendor that the injury

to City which could result from a failure of Contractor/vendor to complete on schedule is uncertain and cannot be computed exactly. In no way shall costs for liquidated damages be construed as a penalty.

Any notice to any Contractor/Vendor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted, by certified or registered mail, to the said Contractor/Vendor at his last given address or delivered in person to the said Contractor/Vendor or his authorized representative on the work.

19. ***Conditions***: The bidder shall list on a separate sheet of paper any variations from, or exceptions to, the conditions and specifications of this bid. This sheet shall be labeled "Exceptions to Bid Conditions and Specifications", and shall be attached to the bid. Any variations or exceptions shall meet or exceed the plans and specifications.

20. ***Quantities***: An estimate of the quantities of work to be done and/or materials to be furnished is given in the specifications. It is the result of the City's calculations and is believed to be correct. It is given only as a basis of comparison of bids and the City does not expressly or by implication agree that the actual quantities involved will correspond exactly therewith; nor shall the bidder plead misunderstanding or deception because of such estimates of quantities, or of the character, location, or other conditions pertaining to the work performed or materials furnished in accordance with the plans and specifications. It is understood that the quantities may be increased or decreased without in any way invalidating the unit bid prices.

21. ***Public Records***: In accordance with 119.0701 F.S. Contractor shall:

IF CONSULTANT OR CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONSULTANT'S OR CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT OR CONTRACT, THEY SHALL CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:

LORI HILLMAN, CITY CLERK
CITY OF ZEPHYRHILLS
5335 8TH STREETH
ZEPHYRHILLS, FLORIDA 33542
LHILLMAN@CI.ZEPHYRHILLS.FL.US
813-780-0000

22. ***Correction of Work***. All work, all materials, whether incorporated in the work or not, all processes of manufacture, and all methods of construction shall be at all times and places subject to the inspection of the Architect/Engineer who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture, and methods of construction for the purposes for which they are used. Should they fail to meet his approval they shall be forthwith reconstructed, made good replaced and/or corrected, as the case may be by the Contractor/Vendor at his own expense. Rejected materials shall immediately be removed from the site. If, in the opinion of the Architect/Engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor/Vendor hereunder shall be reduced by such amount as in the judgment of the Architect/Engineer shall be equitable.

23. ***Subsurface Conditions Found Different***. Should the Contractor/Vendor encounter sub-surface and/or latent conditions at the site materially differing from those shown on the Plans or indicated in the Specifications, the Contractor/Vendor shall immediately give notice to the Architect/Engineer of such conditions before they are disturbed. The Architect/Engineer will thereupon promptly investigate the conditions, and if he finds that they materially differ from those shown on the Plans or indicated in the specifications he will at once make such changes in the Plans and/or Specification, as the Contractor/Vendor may find necessary, any increase or decrease of cost resulting from such changes to be adjusted in the manner provided in Paragraph 17 of the General Conditions.

24. ***Claims for Extra Cost***. No claim for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Architect/Engineer approved by the Owner, as aforesaid, and the claim presented with the first estimate after the changed or extra work is done. When work is performed under the terms of subparagraph 17 of the General Conditions, the Contractor/Vendor shall furnish satisfactory bills, payrolls, and vouchers covering all items of cost and when requested by the Owner, give the Owner access to accounts relating thereto.

25. ***Termination (Cause and/or Convenience)***.

a. This contract may be terminated in whole or in part in writing by either party in the event of substantial failure by the other party to fulfill its obligations under this contract through no fault of the terminating party, provided that no termination may be effected unless the other party is given (1) not less than ten (10) calendar days written notice (delivered by certified mail, return receipt requested) of intent to terminate and (2) an opportunity for consultation with the terminating party prior to termination.

b. This contract may be terminated in whole or in part in writing by the local government for its convenience, provided that the other party is afforded the same notice and consultation opportunity specified in 1(a) above.

c. If termination for default is effected by the local government, an equitable adjustment in the price for this contract shall be made, but (1) no amount shall be allowed for anticipated profit on unperformed services or other work, and (2) any payment due to the contractor/vendor at the time of termination may be adjusted to cover any additional costs to the local government because of the contractor's or vendor's default.

If termination for convenience is affected by the local government, the equitable adjustment shall include a reasonable profit for services or other work performed for which profit has not already been included in an invoice.

For any termination, the equitable adjustment shall provide for payment to the contractor/vendor for services rendered and expenses incurred prior to receipt of the notice of intent to terminate, by the contractor/vendor relating to commitments (e.g., suppliers, subcontractors) which had become firm prior to receipt of the notice of intent to terminate.

d. Upon receipt of a termination action under paragraphs (a) or (b) above, the contractor/vendor shall (1) promptly discontinue all affected work (unless the notice directs otherwise) and (2) deliver or otherwise make available to the local government all

data, drawings, reports specifications, summaries and other such information, as may have been accumulated by the contractor/vendor in performing this contract, whether completed or in process.

e. Upon termination, the local government may take over the work and may award another party a contract to complete the work described in this contract.

f. If, after termination for failure of the contractor/vendor to fulfill contractual obligations, it is determined that the contractor/vendor had not failed to fulfill contractual obligations, the termination shall be deemed to have been for the convenience of the local government. In such event, adjustment of the contract price shall be made as provided in paragraph (c) above.

PRELIMINARY MATTERS

Delivery of Bonds: Simultaneously with the execution and delivery of the Agreement, the Contractor/Vendor shall deliver to the City the required executed Bonds. Additional copies will be furnished, upon request, at the cost of reproduction.

Before Starting Work: Before starting the work at the site, the Contractor/Vendor shall furnish the City with certificates of insurance and schedules as required by the City and a conference will be held to review the above schedules, to establish procedures for handling Applications for Payment and to establish a working understanding between the parties as to the Project. Present at the conference will be the City and its representative, the Contractor/Vendor and his Superintendent.

The Contractor/Vendor shall furnish a list of key personnel within **fifteen (15)** calendar days of starting construction. This list should include the superintendent, all personnel at the site and their assignments, name, title, telephone numbers (work and cellular) along with email addresses.

Before undertaking the Work, the Contractor/Vendor shall carefully study and compare the Contract Documents and check and verify all figures shown thereon and all field measurements. He shall at once report in writing to the City any conflict, error or discrepancy which he may discover. The Contractor/Vendor assumes full responsibility for having familiarized himself with the nature and extent of the Contract Documents, Work, locality and local conditions that may in any manner affect the Work to be done and represents that he has visited the site.

The City shall give the Contractor/Vendor a written Notice to Proceed, stating a date on which it is expected that the Contractor/Vendor will start the work. No work shall be done prior to the date on which the Work is to start.

The Contractor/Vendor Time shall commence to run on the date of the Notice to Proceed.

CORRELATION, INTERPRETATION, AND INTENT OF CONTRACT DOCUMENTS

For Construction: It is the intent of the Specifications and Drawings to describe a complete Project to be constructed in accordance with the Contract Documents. The Contract Documents comprise the entire

Agreement between the City and the Contractor/Vendor. They may be altered only by a Modification The Contract Documents cover, with explicit provisions, all matters relating to the work which the Contractor/Vendor undertakes to construct or perform in full compliance with such provisions. It is understood that the Contractor/Vendor has, by personal examination and inquiry, if necessary, satisfied himself as to all local conditions and as to the meaning, requirements and reservations of the Contract Documents. No deviation will be allowed from the City's interpretation thereof. The intent of the Contract Documents is to include all labor, materials, equipment, and transportation necessary for the proper execution of the work. The Contractor/Vendor shall make plural and complete all work which, to avoid needless repetition or for the sake of brevity, has been shown singly or partially indicated. The Contractor/Vendor shall follow the Drawings and execute all work in strict accordance therewith and with the kind and quality of materials indicated and specified. Materials or work described in words which, when so applied, have a well-known technical or trade meaning shall be held to refer to such recognized standards. Any deviation from Specifications, which may be required by the exigencies of construction, shall in all cases conform to written instructions of the City. The applicable provisions of the Contract Documents shall apply with equal force to all work, including extra work, performed under this Contract, whether performed either directly by the Contractor/Vendor or by any Subcontractor.

The Contract Documents are complementary; what is called for by one is as binding as if called for by all. If the Contractor/Vendor finds a conflict, error or discrepancy in the Contract Documents, he shall call it to the City's attention in writing before proceeding with the Work affected thereby. In resolving such conflicts, errors and discrepancies, the documents shall be given precedence in the following order: Agreement, Special Conditions, General Conditions, Specifications, including any Addenda, Drawings,

Invitation to Bid and Contractors/Vendors Bid. Any work that may reasonably be inferred from the Specifications or Drawings as being required to produce the intended result shall be supplied whether or not it is specifically called for. Work, materials or equipment described in words which so applied have a well-known technical or trade meaning shall be deemed to refer to such recognized standards.

Insurance: Contractor/vendor shall, at its sole cost and expense, procure and maintain throughout the term of the contract, Comprehensive General Liability and Worker's Compensation insurance, including Employer Liability insurance, with minimum policy limits of $1,000,000 (this could be $2,000,000 depending on the amount of the contract) combined Single Limits, or to the extent and in such amounts as required and authorized by Florida law, and will provide endorsed certificates of insurance generated and executed by a licensed insurance broker, brokerage or similar licensed insurance professional evidencing such coverage, and naming the City of Zephyrhills as a named, additional insured, as well as furnishing the City of Zephyrhills with a certified copy, or copies, of said insurance policies. Certificates of insurance and certified copies of these insurance policies must accompany the signed contract. Said insurance coverages procured by the contractor/vendor as required herein shall be considered, and the contractor/vendor agrees that said insurance coverages it procures as required herein shall be considered, as primary insurance over and above any other insurance, or self-insurance, available to the City of Zephyrhills, and that any other insurance, or self-insurance available to the City of Zephyrhills shall be considered secondary to, or in excess of, the insurance coverage(s) procured by the contractor/vendor as required.

Nothing shall be construed to extend the City of Zephyrhills's liability beyond that provided in section 768.28, Florida Statutes.

Builders' Risk Coverage: ***For any contracts that may apply to the following in the first sentence should also include statement below.*** If this solicitation includes: (1) construction of a new above-ground structure or structures, or (2) any addition(s), improvement(s), alteration(s), or repair(s), to an existing above-ground structure or structures, or (3) the installation of machinery or equipment into an existing

structure or structures, the Contractor shall provide, in a policy acceptable to the City, "all risk" (i.e., Special Form) property insurance on any such construction, additions, machinery or equipment. The amount of the insurance shall be no less than the estimated replacement value at the time of the City's final acceptance of such new structures, addition(s), improvement(s), alternation(s), repair(s), machinery or equipment. The coverage shall not be subject to any restriction with respect to occupancy or use by the City and, subject to thirty (30) days' prior written notice to the City shall remain in full effect until final acceptance by the City. In addition, the City, the Professional, and the Contractor's subcontractors of any tier, shall be additional insureds on this policy. The insurance shall include a deductible no greater than one percent (1%) of the Contract amount, or $25,000, whichever is smaller, for which the Contractor shall be responsible. The risk of loss whether insured or not shall remain with the Contractor until final acceptance. Upon request, Contractor shall furnish to the City complete copies of the insurance policy.

Liens: The Contractor/vendor shall indemnify and save harmless the City from all claims, demands, causes of action, suits of whatever nature arising out of the services, labor, and materials furnished by the Contractor/Vendor or its Subcontractors under this Contract, and from all laborers', materialmen's and mechanics' liens upon the property which the work is located arising out of the services, labor, and materials furnished by the Contractor/Vendor or any of its Subcontractors under this Contract; and shall keep said property free and clear of all liens, claims, and encumbrances arising from the performance of this Contract by the Contractor/Vendor or its Subcontractors; the Contractor/Vendor hereby waiving all rights to claim such lien on the City's properties.

If required, the Contractor/Vendor shall furnish at the City's option either (a) a good and sufficient release or waiver of lien from itself, every subcontractor, materialman, laborer, and other person furnishing services, labor, or materials in connection with the work or (b) receipts in full, together with an affidavit that the receipts cover all the services, labor, and materials furnished by the Contractor/Vendor or its Subcontractors for which a lien might be filed except as covered by the releases and waivers of liens; but if any Subcontractor, laborer, materialman, or other person refuses to furnish a waiver or release a receipt in full, the Contractor/Vendor may furnish a Bond satisfactory to the City to indemnify the City against any claim or lien or otherwise. (c) Surety Bond may be furnished by the Contractor/Vendor or his Surety as a guarantee that he will execute the work in accordance with the terms of the Contract, and that he shall make all payments for all labor, materials and supplies directly or indirectly for the work. If Surety Bond is required by the City, Contract price will be increased by an amount equal to the cost of securing said Bond.

Definitions: The following terms are respectively defined as follows:

- Contractor/Vendor: A person, firm or corporation with whom the contract is made by the Owner/City.
- Subcontractor: A person, firm or corporation supplying labor and materials or only labor for at the site of the project for, and under separate contract or agreement with the Contractor/Vendor.
- Work on (at) the Project: Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the Contractor and any subcontractor.
- Owner: Can represent the City of Zephyrhills and/or property/business owners.

CONTRACTOR'S or VENDOR's RESPONSIBILITIES

Supervision and Superintendence: The Contractor/Vendor shall supervise and direct the Work efficiently and with his best skill and attention. He shall be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor/Vendor shall be responsible to see that the

finished Work complies accurately with the Contract Documents. The Contractor/Vendor shall accept full responsibility for the work until final acceptance. He shall protect the work against all loss or damage sustained during the progress of the work and promptly repair any damage done from any cause whatsoever. After acceptance of the work, Contractor's or Vendor's responsibility shall extend to defective or faulty work as later defined in these specifications.

The Contractor/Vendor shall keep on the Work site at all times during its progress, a competent resident superintendent who shall not be replaced without written consent of the City, under extraordinary circumstances. The Superintendent will be the Contractor's or Vendor's representative at the Site and shall have the authority to act on behalf of the Contractor/Vendor. He shall be present at the pre-construction conference. All communications given to the Superintendent shall be as binding as if given to the Contractor/Vendor.

Labor, Materials, Equipment, and Manufactured Articles: The Contractor/Vendor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. He shall at all times maintain good discipline and order at the site.

The Contractor/Vendor shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities, and all other facilities and incidentals necessary for the execution, testing, and initial operation and completion of the Work. Any work necessary to be performed after regular working hours, on Sunday or legal holiday, shall be performed without additional expense to the City.

All materials and equipment shall be new, except as otherwise provided in the Contract Documents. If required by the City, the Contractor/Vendor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. All material and workmanship shall in every respect, be in accordance with what, in the opinion of the City, is in conformity with approved modern practice.

Contractor's or Vendor's Title to Materials: No materials or supplies for the work shall be purchased by the Contractor/Vendor or by any Subcontractor subject to any chattel mortgage or under a conditional sale contractor/vendor or other agreement by which an interest is retained by the seller. The Contractor/Vendor warrants that he has good title to all materials and supplies used by him in the work, free from all liens, claims or encumbrances.

Request for Information (RFI): Immediately on discovery of the need for additional information the Contractor/Vendor shall submit a RFI to the Owner's representative, Project Manager.

Use of Premises: The Contractor/Vendor shall confine his equipment, the storage of materials and equipment and the operations of his workmen to areas permitted by law, ordinances, or permits and shall not unreasonably encumber the premises with materials or equipment. Materials stored without proper permits shall be promptly relocated upon request by the City at the Contractor's or Vendor's expense.

Record Drawings: The Contractor/Vendor shall keep one record copy of all Specifications, As-built Drawings, Addenda, Modifications and Shop Drawings at the site in good order and annotated to show all changes made during the construction process. These shall be available to the RPR and the Engineer. As-builts shall be delivered to them for the City and Engineer upon completion of the Project. Release of retainage shall be contingent upon delivery of red-lined "as-builts".

Supplementary Drawings: When, in the opinion of the City, it becomes necessary to explain more fully the work to be done, or to illustrate the work further, or to show any changes which may be required,

drawings, known as supplementary drawings, with specifications pertaining thereto, will be prepared by the Engineer.

The additional drawings and instructions supplied to the Contractor/Vendor will coordinate with the Contract Documents and will be prepared that they can be reasonably interpreted. The Contractor/Vendor shall carry out the work in accordance with the additional detail drawings and instructions. The Contractor/Vendor and the Architect/Engineer will prepare jointly: (a) a schedule, fixing the dates at which special detail drawings will be required, such drawings, if any, to be furnished by the Architect/Engineer in accordance with said schedule, and (b) a schedule fixing the respective dates for the submission of shop drawings; the beginning of manufacture, testing and installation of materials, supplies and equipment; and the completion of the various parts of the work; each such schedule to be subject to change from time to time in accordance with the progress of the work The supplementary drawings shall be binding upon the Contractor/Vendor with the same force as the drawings. Where such supplementary drawings require either less or more than the estimated quantities of work, credit to the City or compensations therefore to the Contractor/Vendor shall be subject to the terms of the agreement.

Shop or Setting Drawings: The Contractor/Vendor shall submit promptly to the Architect/Engineer four (4) copies of each shop or setting drawing prepared in accordance with the schedule predetermined as aforesaid. After examination of such drawings by the Architect/Engineer and the return thereof, the Contractor/Vendor shall make such corrections to the drawings as have been indicated and shall furnish the Architect/Engineer with four (4) corrected copies. If requested by the Architect/Engineer the Contractor/Vendor must furnish additional copies. Regardless of corrections made in or approval given to such drawings by the Architect/Engineer, the Contractor/Vendor will nevertheless be responsible for the accuracy of such drawings and for their conformity to the Plans and Specifications, unless he notifies the Architect/Engineer in writing of any deviations at the time he furnishes such drawings.

Architect/Engineer's Authority: The Architect/Engineer shall give all orders and direction contemplated under the contract and specifications, relative to the execution of the work. The Architect/Engineer shall determine the amount, quality, acceptability, and fitness of the several kinds of work and materials that are to be paid for under this contract and shall decide all questions which may arise in relation to said work and the construction thereof. The Architect/Engineer's estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties hereto relative to said contract or specifications; the determination or decision of the Architect/Engineer shall be a condition precedent to the Contractors/Vendors to receive any money or payment for work under this contract affected in any manner or to any extent by such question.

The Architect/Engineer shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work that may arise between the contractor/vendor under this contract and other Contractors/Vendors performing work for the City shall be adjusted and determined by the Architect/Engineer.

Safety and Protection: The Contractor/Vendor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. He shall take all necessary precautions for the safety of and shall provide the necessary protection to prevent damage, injury or loss to:

All employees on the Work and other persons who may be affected thereby.

All the Work and all materials or equipment to be incorporated therein, whether

in storage on or off the site.

Other property, including City property, at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The Contractor/Vendor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in the contract or by the City, or his duly authorized representatives. He shall notify the Architect/Engineer immediately. Any claim for compensation by the Contractor/Vendor shall be promptly submitted to the Architect/Engineer for approval.

The Contractor/Vendor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's Superintendent unless otherwise designated in writing by the Contractor/Vendor to the City.

SAFETY PLAN

A. It is the contractor's or vendor's responsibility to comply with OSHA standards and all regulations pertaining to the work including confined space entry.

B. Precaution shall be exercised at all times for the protection of persons and property. The safety provisions of applicable laws, and existing building and construction codes shall be guarded in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractor of America, and OSHA's Safety and Health Standards (29 CFR 1926/1910) U.S. Department of Labor, to the extent that such provisions are not in contravention of applicable law.

C. ***Safety Requirements***:

1. The Contractor/Vendor shall provide documentation on Means of Egress, Emergency Evacuation, Confined Space Entry, Lock Out – Tag Out, Hot Work Permit, Hurricane Preparedness, Right-to-Know / MSDS Sheets to the satisfaction of the City prior to commencement of any single job.
2. A Contractor/Vendor Process Safety Management Briefing will be held at the Pre-Construction Conference. The Contractor/Vendor will be required to attend this briefing and sign a form so stating that he has been briefed. A copy of this form is included in the Forms section of this package.

Trench Safety Act: Each contractor must submit with his bid an executed sworn certification that he will comply with the Trench Safety Act, Chapter 90-96, Florida Statues, on trench safety.

Emergencies: In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor/Vendor, without special instruction or authorization from the City, is obligated to act, at his discretion, to prevent threatened damage, injury or loss.

Assignability. The Contractor/Vendor shall not assign the whole or any part of this contract or any monies due or to become due hereunder without written consent of the Owner. In case the Contractor/Vendor assigns all of any part of any monies due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that right of the assignee in and to any monies due or to become due to the Contractor/Vendor shall be subject to prior claims of all persons, firms and corporations of services rendered or materials supplied for the performance of the work called for in this contract.

Mutual Responsibility of Contractors/Vendors. If, through acts of neglect on the part of the Contractor/Vendor, any other Contractor/Vendor or any subcontractor shall suffer loss or damage on the work, the Contractor/Vendor agrees to settle with such other Contractor/Vendor or subcontractor by agreement or arbitration if such other Contractor/Vendor or subcontractor will so settle. If such other Contractor/Vendor or subcontractor shall assert any claim against the Owner or account of any damage alleged to have been sustained, the Owner shall notify the contractor/vendor, who shall indemnify and save harmless the Owner against any such claim.

Subcontractors: The Contractor/Vendor shall not employ any Subcontractor against whom the City may have reasonable objection, nor will the Contractor/Vendor be required to employ any Subcontractor against whom he has reasonable objection. Within 30 calendar days after the date of the Award of Contract and before the City shall make any partial payments to the Contractor/Vendor, the Contractor/Vendor shall furnish to the City in writing for acceptance by the City a list of the names of the Subcontractors proposed for the principal portions of the work. The Contractor/Vendor shall not make any substitution for any Subcontractor who has been accepted by the City, unless the City determines that there is good cause for doing so.

The Contractor/Vendor shall be fully responsible for all acts and omissions of his Subcontractors and of persons directly or indirectly employed by them and of persons for whose acts any of them may be liable to the same extent that he is responsible for the acts and omissions of persons directly employed by him. Nothing in the Contract Documents shall create any contractual relationship between any Subcontractor and the City or any obligation on the part of the City to pay or to see to the obligation on the part of the City to pay or to see to the payment of any moneys due any Subcontractor, except as may otherwise be required by law. The City may furnish to any Subcontractor, to the extent practicable, evidence of amounts paid to the Contractor/Vendor on account of specific work done in accordance with schedule of values.

The divisions and sections of the Specifications and the identifications of any Drawings shall not control the Contractor/Vendor in dividing the work among Subcontractors or delineating the work to be performed by any specific trade.

The Contractor/Vendor agrees to bind specifically every Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the City. The terms of the Contract Documents shall control over any discrepancy in any other document.

Laws and Regulations: The Contractor/Vendor shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the work. If the Contractor/Vendor observes that the Specifications or drawings are at variance therewith, he shall give the City prompt written notice thereof, and any necessary changes shall be adjusted by an appropriate Modification. If the Contractor/Vendor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations and without such notice to the Engineer, he shall bear all costs arising therefrom; however, it will not be his primary responsibility to make certain that the drawings and Specifications are in accordance with such laws, ordinances, rules and regulations.

Permits and Protection of Public: The Contractor/Vendor shall be required to observe all the ordinances in relation to obtaining permits for occupying, excavating or in anywise obstructing the streets and alleys. He shall erect and maintain barricades and sufficient safeguards around all excavations, embankments or obstructions.

Where there are telephone, telegraph, light or power poles; water mains, conduits, pipe, or drains; or other construction either public or private; in or on the streets or alleys; the work shall be so conducted

that no interruption or delay will be caused in the operation or use of the same. Proper written notice shall be given and all the facilities afforded the owners of such construction encountered or likely to be encountered, as will enable them to preserve the same from injury.

Unless otherwise expressly provided for in the Specifications, the City will furnish to the Contractor/vendor all surveys necessary for the execution of the work.

The Contractor/Vendor shall procure and pay all other permits, licenses and approvals necessary for the execution of this contract and shall comply with all Florida Department of Environmental Protection requirements. Cost of building permits will be paid by the contractor. ***The selected Contractor/Vendor must be registered with the City of Zephyrhills Building Department before starting the project.***

Use of Premises: The Contractor/Vendor shall confine his equipment, the storage of materials and equipment and the operations of his workmen to areas permitted by law, ordinances, or permits and shall not unreasonably encumber the premises with materials or equipment. Materials stored without proper permits shall be promptly relocated upon request by the City at the Contractor's or Vendor's expense.

Quality Control: The Contractor/Vendor shall maintain quality control over suppliers, manufacturers, products, services, site-conditions, and workmanship to assure they meet or exceed requirements of Standard and local building codes.

Cleaning: The Contractor/Vendor shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the work. The Contractor shall clean up work site, interior and exterior of building, any and all equipment or fixtures must operate properly and not show any signs of damage or any defects. At the completion of the work he shall remove all waste materials, rubbish, and debris from and about the premises as well as all tools, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by the City. The Contractor/Vendor shall restore to their original condition those portions of the site for alteration by the Contract Documents.

Protection of Work and Materials: Facilities for handling of material and inspecting the work shall at all times be furnished by the Contractor/Vendor, and all costs due to delays in handling of materials or equipment, and loss or damage, shall be at the expense of the Contractor/Vendor. The Contractor/Vendor shall be responsible for all materials, equipment and supplies sold and delivered to

the City until final inspection of the work and acceptance thereof by the City. In the event any such materials, equipment and supplies are lost, stolen, damaged or destroyed prior to receipt of delivery, Contractor/Vendor shall replace same without cost to the City.

Lands and Right-of-Way: Prior to the start of construction, the City shall obtain all lands and right-of-way necessary for the carrying out and completion of work to be performed under this contract.

Other Prohibited Interests: No official of the City who is authorized in such capacity and on behalf of the City to negotiate; make, accept or approve or to take part in negotiating, making, accepting or approving any architectural, engineering, inspection, construction or material supply contract or any subcontracting connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part hereof. No official who is authorized in such capacity and on behalf of the City to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, insurance contract, or any other contract pertaining to the project.

Construction Schedule and Periodic Estimates: Immediately after execution and delivery of the contract, and before the first partial payment is made, the Contractor/Vendor shall deliver to the City an estimated construction progress schedule in a form satisfactory to the City, showing the proposed dates of commencement and completion of each of the various subdivision of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due to the Contractor/Vendor in accordance with the progress schedule. The Contractor/Vendor shall also furnish on forms mutually agreeable to the Engineer, Contractor/Vendor and the City: (a) a detailed estimate giving a complete breakdown of the contract price, and (b) periodic itemized estimates of work done for the purpose of making partial payments therefore. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

Payments to Contractor/Vendor. (a) At the end of each calendar month during the life of the contract, the contractor/vendor will prepare an estimate of the quantities of the work completed and of the total amount due. The amount will be due on or before the 15th day of the second month following the completion of said work. (b) In preparation of monthly partial pay, estimated accounts may be taken if specifically approved by the owner of materials delivered to the site of work but not yet incorporated into the work. (c) When the work provided for by the contract has been completely performed on the part of the contractor/vendor and all parts of the work have been approved by the engineer and accepted by the owner, a final estimate will be prepared which shows the total cost of the work performed under the contract, including extra work as authorized by change orders, the total amount retained, and the total amount paid on previous partial estimates. All prior estimates upon which payments have been made are subject to necessary corrections or revisions in the final payment. All pay estimates will be reviewed for correctness by the engineer and approved by the owner before payment. NOTE: All payments will be processed by ACH/EFT processing and the contractor will need to be enrolled.

Payments by Contractor/Vendor. The Contractor/Vendor shall pay: (a) for all transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered; and (b) for all materials, tools, and other expendable equipment to the extent of ninety percent (90%) of the cost thereof, not later than the 20th day of the calendar month following that in which such materials, tools, and equipment are delivered at the site of the project, and the balance of the cost thereof, not later than the 30th day following the completion of that part of the work in or on which such materials, tools and equipment are incorporated or used; (c) to each of his subcontractors, not later than the 5th day

following each payment to the Contractor/Vendor, the respective amounts allowed the Contractor/Vendor on account of the work performed by his subcontractors to the extent of each subcontractor's interest.

Acceptance of Final Payment Constitutes Release: The acceptance by the Contractor/Vendor of final payment shall be and shall operate as a release to the City of all claims and all liability to the Contractor/Vendor for all things done or furnished in connection with this work and for every act and neglect of the City and others relating to or arising out of this work. No payment, however, final or otherwise, shall operate to release the Contractor/Vendor or his sureties from any obligations under this contract or the Performance and Payment Bond.

Decisions in Disagreements: The Engineer will be the interpreter of the terms and conditions of the Contract Documents and the judge of the performance thereunder. In his capacity as interpreter and judge, he will exercise his best efforts to ensure faithful performance by both the City and the Contractor/Vendor. He will not show partiality to either and shall not be liable for the result of any interpretation or decision rendered in good faith. Claims, disputes and other matters relating to the

execution and progress of the work or the interpretation of or performance under the Contract Documents shall be referred to the Engineer for decision; which he will render in writing within a reasonable time.

Change Orders: Without invalidating the Agreement, the City may, at any time or from time to time, order additions, deletions, or revisions in the work authorized by an executed, signed Change Order. Change Orders should be submitted on an **AIA Document G701** *(exampled attached in the Forms section of this package)*. Change Orders is a defined written instrument prepared by the Contractor and signed by both Contractor and authorized City representative.

Upon receipt of an executed authorized Change Order, the Contractor/Vendor shall proceed with the work involved. All such work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment will be made.

The RPR may authorize changes or alterations in the work not involving extra cost and not inconsistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order. If the Contractor/Vendor believes that any minor change or alteration authorized by the RPR entitled him to an increase in the Contract Price, he may make a claim in writing.

The Contractor/Vendor shall not start work on any alteration requiring an increase or decrease in price or extension of time until a Change Order setting forth the adjustments is executed by the City.

It is the Contractor's or Vendor's responsibility to notify his Surety of any changes affecting the general scope of the work or change in the Contract Price and the amount of the applicable Bonds shall be adjusted accordingly. The Contractor/Vendor shall furnish proof of such adjustment to the City.

Change of Contract Time: The Contract Time may only be changed by a Change Order. Any claim for an extension in the Contract Time, shall be in writing delivered to the City within five days of the occurrence of the event giving rise to the claim. All claims for adjustment in the Contract Time shall be determined by the Engineer if the City and the Contractor/Vendor cannot otherwise agree. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.

The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of the Contractor if he makes a claim therefore as provided for. Such delays shall include, but not be restricted to, acts or neglect by any separate Contractor/Vendor employed by the City, fires, floods, labor disputes, epidemics, abnormal weather conditions, or acts of God.

All time limits stated in the Contract Documents are of the essence of the Agreement.

Whenever changes in the work are ordered by written Modification, the extension to the Contract Time, if an extension is to be allowed, shall be noted in the same written Modification.

Claims for extension of Contract Time will be approved only if the work or the event which causes the delay, affects the path of critical events of the project. In such case an extension of time will then be allowed only to equal the number of days by which this path of events is lengthened. If required by the Engineer, Contractor/Vendor shall indicate this path of critical events, by diagram or narrative, in such detail as may be necessary to justify his claim and establish the number of days' delay. The path of critical events mentioned herein is defined as that series of interdependent construction events which must be sequentially performed and which require a longer total time to perform than any other such series. Said

extension shall be, as determined by the Engineer, sufficient to compensate for the detention, provided it shall have immediate notice from the Contractor/Vendor, in writing, of the cause and the probable length of the detention; however, neither an extension of any time for any reason beyond the date set herein, nor the acceptance of any work subsequent to said date, shall be deemed a waiver by the City of the right to abrogate the Contract for delay.

Weather Conditions: In the event of temporary suspension of work, or during inclement weather or whenever the Architect/Engineer shall direct, the Contractor/Vendor will and will cause his subcontractors to carefully protect his and their work and materials against damage or inquiry from the weather. If, in the opinion of the Architect/Engineer, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor/Vendor or any of his Subcontractors to protect this work, such materials shall be removed and replaced at the expense of the Contractor/Vendor.

Photographs of the Project. *If required by the Owner, the Contractor/Vendor shall furnish photographs of the project, in the quantities* as requested.

Tests and Inspections: All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Owner. The offer or payment of any compensation, whatever may be its character or form, the offer or giving of any gratuity, or the offer or granting of any valuable favor by the Contractor/Vendor to any Inspection, directly or indirectly, is strictly prohibited, and any such act on the part of the Contractor/Vendor will constitute a violation of this Contract.

If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any work to specifically be inspected, tested, or approved by someone other than the Contractor/Vendor, the Contractor/Vendor shall give the City notice of readiness therefore. The Contractor/Vendor shall furnish the City the required certificates of inspection, testing or approval. All such tests shall be in accordance with the methods prescribed by the American Society for Testing and Materials or such other applicable organization as may be required by law or the Contract Documents. If any such work required so to be inspected, tested or approved is covered without approval of the City, it shall be requested by the City, be uncovered for observation at the Contractor's or Vendor's expense. The cost of such inspections, tests, and approvals shall be borne by the Contractor/Vendor unless otherwise provided.

The City of Zephyrhills shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

Use and Occupancy Prior to Acceptance by City: The Contractor/Vendor agrees to the use and occupancy of a portion or unit of the project before formal acceptance by the City, provided the City:

A. Secures written consent of the Contractor/Vendor except in the event, in the opinion of the Architect/Engineer, the Contractor/Vendor is chargeable with unwarranted delay in final cleanup or punch list items or other contract requirements.
B. Secures endorsement from the insurance-carrier and consent of the Surety permitting occupancy of the building or use of the project during the remaining period of construction.

Acceptance: Upon completion, the project manager shall inspect the project to assure all quality control standards are in compliance with the plans and specifications contained herein. The contract retainage ten (10%) will be released for final payment upon completion of all punch list items.

Guarantee and Warranties: Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the City, shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor/Vendor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The

Contractor/Vendor shall remedy any defect in the work and pay for any damage to other work resulting there from, which shall appear within a period of one (1) year from the date of final acceptance of the work unless a longer period is specified. The City will give notice of observed defects with reasonable promptness.

All guarantees and warranties shall commence on the date of substantial completion or on acceptance by the owner of re-work items. The Contractor shall furnish a one (1) year unconditional warranty. The warranty shall include all manufacturers' warranties on equipment and material installed by the Contractor or any subcontractors. These items shall be transferred to the City and in the City's name. All warranty items shall be secured in an organized 3-ring binder.

City May Stop the Work: If the work is defective, or the Contractor/Vendor fails to supply sufficient skilled workmen or suitable materials or equipment or if the Contractor/Vendor fails to make prompt payments to Subcontractors for labor, materials, or equipment, the City may order the Contractor/Vendor to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the City to stop the work shall not give rise to any duty on the part of the City to exercise this right for the benefit of the Contractor/Vendor or any other party.

For each consecutive calendar day that the work remains incomplete after the date established for final completion, the Contractor/Vendor shall pay City and the City is authorized to retain from the compensation otherwise to be paid to the Contractor/Vendor the sum of the phase schedule, **$1000.00**. This amount is the minimum measure of damages the City will sustain by failure of the Contractor to complete all remedial work, correct deficient work, clean up the project and other miscellaneous tasks as required to complete all work specified. This amount is in addition to the liquidated damages prescribed above, and likewise shall not be construed as a penalty.

The Bidder hereby agrees that the City reserves the right to waive any bid and to reject any or all bids, or to accept any bid that in its judgment will be in the best interest of the City. The bidder's signature understands and acknowledges the requirements set forth in this bid package.

_____ _____

Signature/Print Name/Company Date

In witness whereof, the Bidder has hereunto set his signature and affixed his seal this_____day of_____A.D. 2023

_____ (Seal) By: _____

Title: _____

Scope of Work: The City of Zephyrhills is seeking a contractor to construct a force main and water main along the north side of the City. The project will install approximately 12,500 LF of 6-inch force main along Fort King Road between Phelps Road and Simons Road; then continue east along Kossick Road and terminate near South 301/Gall Blvd. Approximately 3,900 LF of the 6-inch force main will be installed using horizontal directional drilling; the remainder will be installed using open-cut methods. The force main will connect to an existing 8-inch PVC force main along South 301/Gall Blvd.

Continuing on Kossick Road, the 8-inch force main will connect to an existing 6-inch PVC force main near Zephyr Lakes Road and continue east, crossing Wire Road, on Otis Allen Road and connect to the existing 8-inch PVC force main that runs along Otis Allen Road. Approximately 1,100 LF of the 8-inch force main will be installed using horizontal directional drilling; the remainder will be installed using open-cut methods.

The project will install approximately 4,100 LF of 12-inch PVC water main along Kossick Road between Fort King Road and Green Slope Drive. The water main will be installed using open-cut methods, no HDD is proposed. The water main will connect to an existing 12-inch PVC water main on Fort King Road and connect to an existing 12-inch PVC water main on Green Slope Drive. No new residential, commercial, or industrial services will be constructed.

This project is sized to accept future additional flows.

All design constraints will comply with the City's standard design requirements and State of Florida building requirements. Please download the package, plans, and specification for complete details.

Estimated Cost: $4.5 million

Hours of Operation: 7:00 AM – 6:00 PM, Monday – Friday,
Refer to Technical Specifications Section 1.06

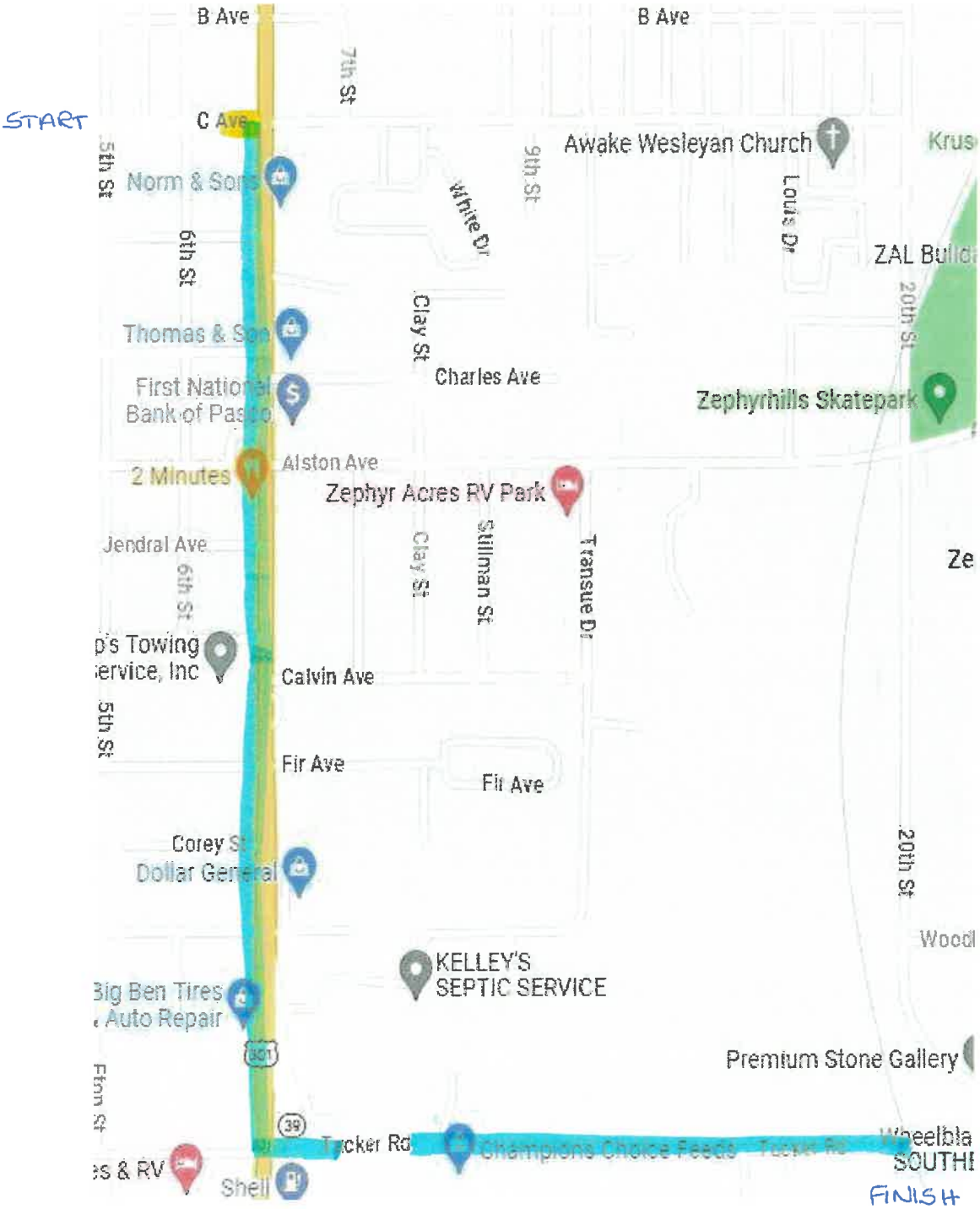
Completion Time: Total estimated project time is about 15 months from Notice to Proceed
Estimated three (3) months for equipment procurement and 12 months
for construction

TelePreConference: Monday, December 4, 2023 or Meet at City Hall-2nd Flr Conf Rm
Link: https://meet.goto.com/159259221
Phone: 1-224-501-3412
Access Code: 159-259-221

This Teleconference will be hosted live at City Hall and via GoTo. Should you attend the meeting in person there will be a visit of the areas.

See next page for location map

Project


START
B Ave
B Ave
7th St
C Ave
5th St
Norm & Sons
6th St
White Dr
9th St
Awake Wesleyan Church
Louis Dr
Krus
ZAL Build
20th St
Clay St
Charles Ave
Thomas & Son
First National Bank of Pasco
Zephyrhills Skatepark
Alston Ave
2 Minutes
Zephyr Acres RV Park
Stillman St
Transue Dr
Jendral Ave
6th St
Clay St
Ze
p's Towing ervice, Inc
Calvin Ave
5th St
Fir Ave
Fir Ave
Corey St
Dollar General
20th St
Woodl
KELLEY'S SEPTIC SERVICE
Big Ben Tires , Auto Repair
301
Premium Stone Gallery
39
Tucker Rd
Champions Choice Feeds
Tucker Rd
Wheelbla
SOUTHI
Fitch St
s & RV
Shell
FINISH

TIME TABLE

Bid Time Table	Date	Day	Time
Bid Distribution	11-20-23	Sunday	
Teleconference Pre-Bid*	12-04-23	Monday	10:00 AM
Equivalent/Question Deadline	12-29-23	Friday	10:00 AM
Response Deadline	01-12-24	Friday	10:00 AM
Presented to City Council	02-12-24	Monday	6:00 PM

*Teleconference: You may need to type the link in manually in order for it to connect.

GoTo Link: https://meet.goto.com/159259221
Phone: +1 (224) 501-3412
Access Code: 159-259-221

This Teleconference will be hosted live at City Hall and via GoTo. Should you attend the meeting in person there will be a visit of the areas.

You may need to type the link into explorer rather than copy/paste.

THE AMERICAN INSTITUTE OF ARCHITECTS

Executed in Counterpart(s)

AIA Document A310

Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we (Here insert full name and address or legal title of Contractor/Vendor)

as Principal, hereinafter called the Principal, and (Here insert full name and address or legal title of Surety)

a corporation duly organized under the laws of the State of
as Surety, hereinafter called the Surety, are held and firmly bound unto
(Here insert full name and address or legal title of Owner)

Bonds and All Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

as Obligee, hereinafter called the Obligee, in the sum of ----------
----------**Dollars ($),**

for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, The Principal has submitted a bid for
(Here insert full name, address and description of project)

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and Sealed this _____ of _____ 2023

_____ ***(Seal)***
(Principal and Title)

_____ ***(Surety Seal)***
(Witness)

_____
(Attorney-in-Fact & Licensed Resident Agent)

SWORN STATEMENT PURSUANT TO SECTION 287.133(3)(a),

FLORIDA STATUTES ON PUBLIC ENTITY CRIMES- ITB-2023-02

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.

A. This sworn statement is submitted to _____
(print name of the public entity)

by_____
(print individual's name and title)

for_____
(print name of entity submitting sworn statement)

whose business address is

_____

_____

and (if applicable) its Federal Employer Identification Number (FEIN) is_____
(If the entity has no FEIN, include the Social ro Number of the individual signing this sworn statement:_____.)

B. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

C. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

D. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes means:

a. A predecessor or successor of a person convicted of a public entity crime; or
b. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

E. I understand that a "person" as defined in Paragraph 287.133(1)(e), Florida Statutes means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or

applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

F. Based on information and belief, the statement which I have marked below is true in relation to the
entity submitting this sworn statement. (Indicate which statement applies.)

_____Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (attach a copy of the final order)

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

_____
(Signature)

Sworn to and subscribed before me this _____ day of
_____, 2023.Personally or known_____
Or Produced identification_____Notary Public – State of _____

_____
My commission expires_____(Type of Identification) _____
(Printed, Typed or stamped commissioned name of notary public)

E-VERIFY CERTIFICATION FORM- ITB 2023-02

All vendors, contractors and subcontractors doing business with the City of Zephyrhills must certify that they have implemented the federal E-Verify program.

E-Verify is a federal system established by the Department of Homeland Security to determine the immigration and work-eligibility status of prospective employees. Detailed E-Verify program information for employers can be found at http://www.dhs.gov/e-verify.

Prior to providing goods or services to the City of Zephyrhills, vendors must certify compliance with the federal E-Verify program. In the case of contractors, this includes obtaining written certification from all subcontractors who will participate in the performance of the contract. The certification below has been prepared for all vendors and contractors to use for this purpose. All subcontractor certifications must be kept on file with the contract vendor and made available to the state and/or City upon request.

CERTIFICATION

(In accordance with Executive Order No. 11-02)

I certify that the company shown below is in compliance with the above statement and that I am authorized to sign on its behalf.

Name of Company: _____

Authorized Signature: _____

Printed Name/Title: _____

Address: _____

Date: _____

Phone: _____

Email: _____

The City of Zephyrhills reserves the right to determine how it will respond to any instances of non-compliance or false certification of compliance. Potential City actions include, but are not limited to, cancellation of the contract and/or suspending or debarring the contract vendor from performing services in any aspect to the City.

Please send the completed form with your submittal.

Addenda Receipt Acknowledgment- ITB 2023-02

Addendum #_____ Date _____ Initials_____

Addendum #_____ Date _____ Initials_____

Addendum #_____ Date _____ Initials_____

Addendum #_____ Date _____ Initials_____

Firm Representative:

_____

Signature/Date **(Executed by Corporate Authority)**

DRUG-FREE WORKPLACE FORM- ITB 2023-02

The undersigned vendor, in accordance with Florida Statute 287.087, hereby

certifies that _____ does:
(Name of Business)

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business' policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or pleas of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm fully complies with the above requirements.

_____
Bidder's Signature

_____
Date

PUR062.036
re. 10/97

NON-COLLUSIVE AFFIDAVIT- ITB 2023-02

State of Florida
County of _____

_____, being first duly sworn, deposes and says that he/she is

_____, the party making the fore-going submittal of qualifications or bid that such submittal
(partner or officer of the Firm, etc)

Or bid is genuine and not collusive or sham; that said Firm has not colluded, conspired, connived or agreed, directly or indirectly, with any Firm or person, to put in a sham response or to refrain from responding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person, to secure any advantage against the City of Zephyrhills of any person interested in the proposed contract; and that all statements in said response are true.

_____
Officer

_____ *(Company Name)*

State of Florida
County of _____

The foregoing instrument was acknowledged before me this _____ day of _____ by
_____ *(name and title of corporate officer)*
of _____ *(Name of Corporation),*
a _____ *(state or place of incorporation)* corporation, on behalf of the corporation. He/she is personally known to me or has produced _____ *(Identification type)* as identification.

_____ *(Signature line for notary public)*

_____ *(Name of notary type, printed or stamped)*

_____ *(Title or rank)*

My commission expires: _____
Serial number, if any _____

Errors or Omissions- ITB 2023-02

Upon review of this project's plans and construction documents are you aware of any apparent errors or omissions?

☐ YES

☐ No

If YES, please provide a detailed explanation of any apparent errors or omissions on this sheet.

Company Representative Date

REFERENCES –PROJECTS OF SIMILAR SCOPE- ITB 2023-02

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 2: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 3: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 4: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

REFERENCES –FOR CURRENTLY ACTIVE PROJECTS- ITB 2023-02

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 2: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 3: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 4: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion Form- ITB 2023-02

1. The prospective Vendor, _____, certifies, by submission of this document, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any Federal Department or Agency.

2. Where the Vendor is unable to certify to the above statement, the prospective Vendor shall attach an explanation to this form.

Vendor: _____
Name of Company – Please Print

Signature: _____
Authorized Company Representative

Name/Title: _____

Address: _____

_____

Date: _____

CITY OF ZEPHYRHILLS

STATEMENT OF NO BID

If you do not intend to bid, please complete the information below and return this form with the bid title and number clearly marked on the front of the envelope. Please send the STATEMENT OF NO BID FORM no later than the opening date indicated on the INVITATION TO BID FORM.

Please be advised that if the NO BID STATEMENT is not executed and returned your name may be deleted from the list of qualified bidders for the City of Zephyrhills.

We decline to submit a bid for the following reasons:

- ❑ Unable to meet Bond or Insurance requirements.
- ❑ Unable to meet specifications; we do not offer this product or an equivalent.
- ❑ Specifications are unclear, specialty items or too intricate.
- ❑ Insufficient time to respond; our schedule will not permit us to perform.
- ❑ Reason for declining on attached sheet.

Company Name: _____Date: _____

Telephone Number: _____Signature: _____

Return completed form to: **City of Zephyrhills, Purchasing Office**
5335 8th Street
Zephyrhills, FL 33542

CERTIFICATION OF CONTRACTOR REGARDING TRENCH SAFETY- ITB 2023-02

This certification is required pursuant to the Trench Safety Act, Chapter 90-98, Florida Statutes regarding Trench Safety. The Act specifically incorporates the Occupational Safety and Health Administration's excavation safety standards, 29 CFR S. 1928.650 Subpart P as the State standard. Any revision to OSHA's safety standards that are consistent with the Florida Statues shall also be complied with upon its effective date. The act requires that any bidder or prospective contractor, or any of their proposed subcontractors, shall provide written assurance that the contractor will comply with the applicable trench safety standards.

Name of Contractor: _____

Address: _____

_____

Phone: _____

1. Contractor agrees that he is aware of the Trench Safety Act and the requirements of the Act.
2. Contractors agrees to comply with all applicable trench safety standards as set forth in the Act and as referenced in the Act.

Name of Signer: _____
PLEASE PRINT

Title: _____

Signature: _____

Date: _____

AIA® Document G701™ – 2017

Change Order

PROJECT: *(name and address)*	CONTRACT INFORMATION: Contract For: Date:	CHANGE ORDER INFORMATION: Change Order Number: Date:
OWNER: *(name and address)*	ARCHITECT: *(name and address)*	CONTRACTOR: *(name and address)*

THE CONTRACT IS CHANGED AS FOLLOWS:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)

The original (Contract Sum) (Guaranteed Maximum Price) was	$ _____
The net change by previously authorized Change Orders	$ _____
The (Contract Sum) (Guaranteed Maximum Price) prior to this Change Order was	$ _____
The (Contract Sum) (Guaranteed Maximum Price) will be (increased) (decreased) (unchanged) by this Change Order in the amount of	$ _____
The new (Contract Sum) (Guaranteed Maximum Price), including this Change Order, will be	$ _____
The Contract Time will be (increased) (decreased) (unchanged) by	( ) days.
The new date of Substantial Completion will be	

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

ARCHITECT *(Firm name)*	CONTRACTOR *(Firm name)*	OWNER *(Firm name)*
SIGNATURE	SIGNATURE	SIGNATURE
PRINTED NAME AND TITLE	PRINTED NAME AND TITLE	PRINTED NAME AND TITLE
DATE	DATE	DATE

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Sample

NORTHSIDE PHASE 3 FORCE MAIN/WATER LINE EXTENSION

BID DOCUMENTS
AND
TECHNICAL SPECIFICATIONS

Project No. 26110-053-01

Owner:

CITY OF ZEPHYRHILLS
5335 8th Street
Zephyrhills, Florida 33542



Engineer:

JONES EDMUNDS & ASSOCIATES, INC.
3910 S. Washington Avenue, Suite 210
Titusville, Florida 32780

November 2023

CITY OF ZEPHYRHILLS
NORTHSIDE PHASE 3 FORCE MAIN/WATER LINE EXTENSION
TECHNICAL SPECIFICATIONS

Kenneth A Fraser

Digitally signed by Kenneth A Fraser
Date: 2023.11.08 13:28:40 -05'00'

Kenneth Acie Fraser, PE, Florida Professional Engineer No. PE57452
This item has been digitally signed and sealed by Kenneth Acie Fraser, PE, on the date indicated here. Printed copies of this document are not considered signed and sealed. The signature must be verified on any electronic copies. The above-named Professional Engineer shall be responsible for the following Divisions in accordance with Rule 61G15-23.004, FAC:
Divisions 1, 2, 3, 5, 9, 15
Jones Edmunds & Associates, Inc.

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DIVISION 0

BIDDING AND CONTRACTING REQUIREMENTS

CITY OF ZEPHYRHILLS
FRONT-END DOCUMENTATION

CITY OF ZEPHYRHILLS

Northside Phase 3 Force Main/Water Line Extension

CONSTRUCTION ITEMIZED PRICING SHEET

Item No.	Item Description	Qty.	Unit	Unit Price	Amount
BASE BID					
1	Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions	1	LS		
2	Traffic Control	1	LS		
3	Environmental Protection	1	LS		
4	Construction Survey and Layout	1	LS		
5	6-Inch, 8-Inch Sanitary Sewer Force Main via Open-Cut	12,978	LF		
6	6-Inch, 8-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	5,000	LF		
7	12-Inch Potable Water Main via Open-Cut	4,100	LF		
8	Combination Air/Vacuum Valves and Vaults	14	EA		
9	Concrete Restoration	2,525	SY		
10	Limerock Restoration	50	SY		
11	Asphalt Concrete Restoration	220	SY		
12	Testing Allowance	1	AL		
13	Record Drawings Allowance	1	AL		
	TOTAL BID PRICE				

DIVISION 1

GENERAL REQUIREMENTS

SECTION 01000
PROJECT REQUIREMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Work to be done consists of the furnishing of all labor, materials, and equipment and the performance of all Work included in this Contract. The summary of the Work is presented in Section 01100, Summary of Work.

B. Work Included

1. The Contractor shall furnish all labor, superintendence, materials, plant power, light, heat, fuel, water, tools, appliances, equipment, supplies, and means of construction necessary for proper performance and completion of the Work. The Contractor shall obtain and pay for all necessary local building permits. The Contractor shall perform and complete the Work in the manner best calculated to promote rapid construction consistent with safety of life and property and to the satisfaction of the Engineer and in strict accordance with the Contract Documents. The Contractor shall clean up the Work and maintain it during and after construction, until accepted, and shall do all Work and pay all costs incidental thereto. He shall repair or restore all structures and property that may be damaged or disturbed during performance of the Work.
2. The cost of incidental work described in these Project Requirements for which there are no specific Contract Items shall be considered as part of the general cost of doing the Work and shall be included in the prices for the various Contract Items. No additional payment will be made therefor.
3. The Contractor shall provide and maintain such modern plant, tools, and equipment as may be necessary, in the opinion of the Engineer, to perform in a satisfactory and acceptable manner all the Work required by this Contract. Only equipment of established reputation and proven efficiency shall be used. The Contractor shall be solely responsible for the adequacy of his workmanship, materials, and equipment, prior approval of the Engineer notwithstanding.

C. Public Utility Installations and Structures

Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, vaults, manholes, and all other appurtenances and facilities pertaining thereto whether owned or controlled by the Owner, other governmental bodies, or privately owned by individuals, firms, or corporations

used to serve the public with transportation, traffic control, gas, electricity, telephone, sewerage, drainage, water, or other public or private property which may be affected by the Work shall be deemed included hereunder.

1. The Contract Documents contain data relative to existing public utility installations and structures above and below the ground surface. These data are not guaranteed as to their completeness or accuracy and it is the responsibility of the Contractor to make his own investigations to inform himself fully of the character, condition, and extent of all such installations and structures as may be encountered and as may affect the construction operations.
2. The Contractor shall protect all public utility installations and structures from damage during the Work. Access across any buried public utility installation or structure shall be made to avoid any damage to these facilities. All required protective devices and construction shall be provided by the Contractor at his expense. All existing public utilities damaged by the Contractor shall be repaired by the Contractor, at his expense. No separate payment shall be made for such protection or repairs to public utility installations or structures.
3. Public utility installations or structures owned or controlled by the Owner or other governmental body which are shown on the Drawings to be removed, relocated, replaced, or rebuilt by the Contractor shall be considered as a part of the general cost of doing the Work and shall be included in the prices bid for the various Contract Items. No separate payment shall be made therefor.
4. Where public utility installations of structures owned or controlled by the Owner or other governmental body are encountered during the Work and are not indicated on the Drawings or in the Specifications, and when, in the opinion of the Engineer, removal, relocation, replacement, or rebuilding is necessary to complete the Work under this Contract, such Work shall be accomplished by the utility having jurisdiction, or such Work may be ordered, in writing by the Engineer, for the Contractor to accomplish. If such work is accomplished by the utility having jurisdiction it will be carried out expeditiously, and the Contractor shall give full cooperation to permit the utility to complete the removal, relocation, replacement, or rebuilding as required. If such work is accomplished by the Contractor, it will be paid for as extra work as provided in the Agreement.
5. At all times in performance of the Work the Contractor shall employ acceptable methods and exercise reasonable care and skill so as to avoid unnecessary delay, injury, damage, or destruction of public utility installations and structures and shall at all times in the performance of the Work avoid unnecessary interference with or interruption of public utility services and cooperate fully with the owners thereof to that end.

6. The Contractor shall give written notice to the Owner and other governmental utility departments and other owners of public utilities of the location of his proposed construction operations at least 48 hours in advance of breaking ground in any area or on any unit of the Work.
7. The maintenance, repair, removal, relocation, or rebuilding of public utility installations and structures, when accomplished by the Contractor as herein provided, shall be done by methods approved by the owners of such utilities.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 DRAWINGS AND PROJECT MANUAL

A. Drawings: When obtaining data and information from the Drawings, figures shall be used in preference to scaled dimensions and large-scale drawings in preference to small-scale drawings.

B. Supplementary Drawings

1. When, in the opinion of the Engineer, it becomes necessary to explain more fully the Work to be done or to illustrate the Work further or to show any changes which may be required, the Engineer will prepare drawings known as Supplementary Drawings, with specifications pertaining to such Drawings, and the Contractor will be furnished one complete set of reproducible black line prints (24 inches by 36 inches) and one reproducible copy of the specifications.
2. The Supplementary Drawings shall be binding upon the Contractor with the same force as the Contract Drawings. Where such Supplementary Drawings require either less or more than the estimated quantities of Work, credit to the Owner or compensation therefor to the Contractor shall be subject to the terms of the Agreement.

C. Contractor to Check Drawings and Data

1. The Contractor shall verify all dimensions, quantities, and details shown on the Drawings, Supplementary Drawings, Schedules, Specifications, or other data received from the Engineer, and shall notify the Engineer of all errors, omissions, conflicts, and discrepancies found therein. Failure to discover or correct errors, conflicts, or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory work, faulty construction, or improper operation resulting therefrom, nor from rectifying such conditions at his own expense. He will not be allowed to take advantage of any errors or omissions, as full instructions will be furnished by the Engineer should such errors or omissions be discovered.
2. All schedules are given for the convenience of the Engineer and the Contractor and are not guaranteed to be complete. The Contractor shall assume all responsibility or the making of estimates of the size, kind, and quality of materials and equipment included in Work to be done under the Contract.

D. Specifications: The Technical Specifications each consist of three parts: General, Products, and Execution. The General part of a Specification contains General Requirements which govern the Work. The Products and Execution parts modify and supplement the General Requirements by detailed requirements for the Work and shall always govern whenever there appears to be a conflict.

E. Intent

1. All Work called for in the Specifications applicable to this Contract, but not shown on the Drawings in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified in either the Drawings or in the Specifications but involved in carrying out their intent or in the complete and proper execution of the Work is required and shall be performed by the Contractor as though it were specifically delineated or described.
2. The apparent silence of the Specifications as to any detail or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used. The interpretation of these Specifications shall be made upon that basis.

1.05 MATERIALS AND EQUIPMENT

A. Manufacturer

1. All transactions with the manufacturers or subcontractors shall be through the Contractor unless the Contractor shall request and at the Engineer's option that the manufacturer or subcontractor deal directly with the Engineer. Any such transactions shall not in any way release the Contractor from his full responsibility under this Contract.
2. Any two or more pieces of material or equipment of the same kind, type, or classification, and being used for identical types of service, shall be made by the same manufacturer.

B. Delivery

1. The Contractor shall deliver materials in ample quantities to ensure the most speedy and uninterrupted progress of the Work so as to complete the Work within the allotted time.
2. The Contractor shall also coordinate deliveries in order to avoid delay in or impediment of the progress of the work of any related Contractor.

C. Tools and Accessories

1. Unless otherwise stated in the Contract Documents, the Contractor shall furnish with each type, kind, or size of equipment, one complete set of suitably marked high-grade special tools and appliances which may be needed to adjust, operate, maintain, or repair the equipment. Such tools and appliances shall be furnished in approved painted steel cases, properly labeled and equipped with good-grade cylinder locks and duplicate keys.
2. Spare parts shall be furnished as specified herein and as recommended by the manufacturer necessary for the operation of the equipment, not including materials required for routine maintenance.
3. Each piece of equipment shall be provided with a substantial nameplate, securely fastened in place, and clearly inscribed with the manufacturer's name, year of manufacture, serial number, weight, and principal rate data.

D. Service of Manufacturer's Engineer

1. The Contract Prices for equipment shall include the cost of furnishing a competent and experienced engineer or superintendent who shall represent the manufacturer and shall help the Contractor, when required, install, adjust, test, and place in operation the equipment in conformity with the Contract Documents.

2. After the equipment is placed in permanent operation by the Owner, the engineer or superintendent shall make all adjustments and tests required by the Engineer to prove that the equipment is in proper and satisfactory operating condition and shall instruct such personnel as may be designated by the Owner in the proper operation and maintenance of such equipment.

1.06 INSPECTION AND TESTING

A. General

1. For tests specified to be made by the Contractor, the testing personnel shall make the necessary inspections and tests, and the reports thereof shall be in such form as will facilitate checking to determine compliance with the Contract Documents. Five copies of the reports shall be submitted and authoritative certification thereof must be furnished to the Engineer as a prerequisite for the acceptance of any material or equipment.
2. If, in the making of any test of any material or equipment, the Engineer ascertains that the material or equipment does not comply with the Contract Documents, the Contractor will be notified thereof and he will be directed to refrain from delivering said material or equipment, or to remove it promptly from the site or from the Work and replace it with acceptable material without cost to the Owner.
3. Tests of electrical and mechanical equipment and appliances shall be conducted in accordance with the recognized test codes of the ANSI, ASME, or the IEEE, except as may otherwise be stated herein.
4. The Contractor shall be fully responsible for the proper operation of equipment during testing and instruction periods and shall neither have nor make any claim for damage which may occur to equipment before the time when the Owner formally takes over the operation thereof.

B. Costs

1. The Contractor shall provide all inspection and testing of materials furnished under this Contract, unless otherwise expressly specified.
2. The Contractor shall bear the cost of shop and field tests of equipment and of certain other tests specifically called for in the Contract Documents, and such costs shall be deemed to be included in the Contract Price.
3. The Owner may test materials and equipment submitted by the Contractor as the equivalent to those specifically named in the Contract for compliance. The Contractor shall reimburse the Owner for the expenditures incurred in making such tests of materials and equipment which are rejected for non-compliance.

C. Certificate of Manufacture

1. The Contractor shall furnish the Engineer with authoritative evidence in the form of a certificate of manufacture that the materials to be used in the Work have been manufactured and tested in conformity with the Contract Documents.
2. These certificates shall be notarized and shall include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product or on similar products of the manufacturer.

D. Shop Tests

1. Each piece of equipment for which pressure, duty, capacity, rating, efficiency, performance, function, or special requirements are specified shall be tested in the shop of the maker in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents.
2. Five copies of the manufacturer's actual test data and interpreted results thereof, accompanied by a certificate of authenticity sworn to by a responsible official of the manufacturing company and/or independent laboratory, shall be submitted to the Engineer for approval.
3. The Contractor shall bear the cost of shop tests and of furnishing manufacturer's preliminary and shop test data of operating equipment.

E. Start-up Tests

1. As soon as conditions permit, the Contractor shall furnish all labor, materials, and instruments and shall make start-up tests of equipment.
2. If the start-up tests disclose any equipment furnished under this Contract which does not comply with the requirements of the Contract Documents, the Contractor shall, before demonstration tests, make all changes, adjustments, and replacements required. The furnishing contractor shall assist in the start-up tests as applicable.

F. Demonstration Tests

1. Before the Contractor's request for a Substantial Completion inspection, all equipment and piping installed under this Contract shall be subjected to demonstration tests as specified or required to prove compliance with the Contract Documents.
2. The Contractor shall furnish labor, fuel, energy, water, and all other materials, equipment, and instruments necessary for all demonstration tests at no additional cost to the Owner. The Contractor shall assist in the demonstration tests as applicable.

1.07 LINES AND GRADES

A. Grade

1. All work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings or as given by the Engineer. The full responsibility for keeping alignment and grade shall rest upon the Contractor.
2. The Engineer will establish bench marks and provide coordination points. Reference marks for lines and grades as the Work progresses will be located by the Contractor to cause as little inconvenience to the prosecution of the Work as possible. The Contractor shall place excavation and other materials so as to cause no inconvenience in the use of the reference marks provided. He shall remove any obstructions he places contrary to this provision.

B. Surveys

1. At his own expense, the Contractor shall furnish and maintain stakes and other such materials.
2. The Contractor shall check such reference marks by such means as he may deem necessary and, before using them, shall call the Engineer's attention to any inaccuracies.
3. At his own expense, the Contractor shall establish all working or construction lines and grades as required from the reference marks set by the Engineer and shall be solely responsible for the accuracy of these lines and grades. He shall, however, be subject to check and review by the Engineer.

C. Safeguarding Marks

1. The Contractor shall safeguard all points, stakes, grade marks, monuments, and bench marks made or established on the Work, bear the cost of re-establishing them if disturbed, and bear the entire expense of rectifying work improperly installed due to not maintaining or protecting or to removing without authorization such established points, stakes, and marks.
2. The Contractor shall safeguard all existing and known property corners, monuments, and marks adjacent to but not related to the Work and shall bear the cost of re-establishing them if they are disturbed or destroyed.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01100
SUMMARY OF WORK

PART 1 GENERAL

1.01 SCOPE OF WORK

Unless otherwise expressly provided in the Contract Documents, the Work must be performed in accordance with best modern practice, with materials and workmanship of the highest quality to the satisfaction of the Owner.

A. The Project title is:

Northside Phase 3 Force Main/Water Line Extension
City of Zephyrhills, Pasco County, Florida
Jones Edmunds Project No. 26110-053-01

B. The Work of this Project includes:

1. Installing approximately 6,000 linear feet (LF) of 6-inch sanitary sewer force main beginning at C Avenue on Gall Boulevard turning onto Tucker Road and ending west of the railroad tracks. Approximately 4,600 LF of the force main will be installed using horizontal directional drilling (HDD); the remainder will be installed using open-cut methods.
2. Installing approximately 3,000 LF of 12-inch potable water main along Gall Boulevard between Alston Avenue and Tucker Road. Approximately 2,700 LF of the potable water main will be installed using HDD; the remainder will be installed using open-cut methods.
3. Project restoration will include repairing pavement, re-sodding of affected areas, and replacing concrete curb/gutter and sidewalk.

C. The Specification divisions and Drawings are an integrated part of the Contract Documents and, as such, will not stand alone if used independently as individual sections, divisions, or drawing sheets. The Drawings and Specifications establish minimum standards of quality for this project. They do not purport to cover all details entering into the design and construction of materials and equipment.

1.02 REFERENCE STANDARDS

Reference standards and recommended practices referred to herein shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Association of State Highway and Transportation Officials (AASHTO) Formerly (AASHO)
B. American Concrete Institute (ACI)
C. American Institute of Steel Construction (AISC)
D. American Iron and Steel Institute (AISI)
E. American National Standards Institute (ANSI)
F. American Standards Association (ASA)
G. American Society of Mechanical Engineers (ASME)
H. American Society of Testing and Material (ASTM)
I. American Water Works Association (AWWA)
J. American Welding Society (AWS)
K. Anti-Friction Bearing Manufacturer's Association (AFBMA)
L. Building Officials and Code Administrators International, Inc. (BOCA)
M. Construction Specifications Institute (CSI)
N. Federal Specification (FS)
O. Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction, Latest English Edition (Standard Specifications)
P. FDOT Roadway and Traffic Design Standards Latest English Edition (FDOT Index)
Q. Geosynthetics Institute (GSI)
R. National Bureau of Standards (NBS)
S. National Electrical Manufacturer's Association (NEMA)
T. National Fire Protection Association (NFPA)
U. Portland Cement Association (PCA)
V. Occupational Safety and Health Act (Public Law 91-596), U.S. Department of Labor (OSHA)
W. Steel Structures Painting Council (SSPC)
X. Southern Standard Building Code (SSBC)
Y. Underwriters' Laboratories, Inc. (UL)
Z. United States of America Standards Institute (USASI)
AA. Regulations of Florida Industrial Commission Regarding Safety
BB. All local, state, county, or municipal building codes requirements of the Owner's Insurance

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.05 GENERAL REQUIREMENTS

A. Unless otherwise specified on the Construction Drawings or Specifications, all work and the quality of materials shall conform to the referenced sections of the Florida Department of Transportation (FDOT) *Standard Specifications for Road and Bridge Construction, Supplementary Specifications*, and *Roadway and Traffic Design Standards*. The Contractor shall retain on the job site copies of these standard FDOT documents. The basis of payment shall conform to Section 01200, Measurement and Payment, of the General Requirements.

1.06 WORKING HOURS

A. Work under this contract shall not be prosecuted on Saturdays, Sundays or on State and/or National holidays, except in time of emergency, and then only under written permission from the Owner who shall be the sole judge as to the urgency of that situation. On weekdays the workday shall be limited to daylight hours.

B. If the Contractor deems it necessary to work on Sundays, holidays, or beyond daylight hours to comply with his construction schedule or because of an emergency, the Contractor shall request permission of the Owner to do so. If, in the opinion of the Owner, the need is bona fide, the Owner will authorize the Contractor to work such hours as may be necessary.

1.07 REIMBURSEMENT FEES

A. The following rates shall be applied as the Owner's reimbursement of the Engineer's fee to be paid by the Contractor for expenses defined in Supplementary Conditions SC-6.02.C, SC-6.05.A.2.f, SC-6.17.E.2, SC-9.05.B, and SC-13.03.A.

1.	Field Representative (Construction):	$125.00
2.	Construction Administrator:	$155.00
3.	Engineering Consultant (Project Manager):	$200.00
4.	Engineering Consultant (Chief Engineer):	$265.00
5.	CADD/Designer:	$125.00
6.	Administrative Assistant:	$ 80.00

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01200
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers methods of measurement and payment for items of work under this Contract.

B. The total Contract Price shall cover all work required by the Contract Documents. All cost in connection with the proper and successful completion of the work, including furnishing all materials, equipment, and tools and performing all necessary labor and supervision to fully complete the work, shall be included in the unit price and lump-sum Bid prices. All work not specifically set forth as a pay item in the Bid Form or Bid Schedule shall be considered a subsidiary/ ancillary obligation of the Contractor and all costs in connection with these subsidiary/ancillary obligations shall be included in the Bid(s) to provide a complete and functional Project.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 EXCAVATION, TRENCHING, AND CLEARING

A. Except where otherwise specified, the unit price or lump-sum price bid for each item of work which involves excavation, trenching, clearing, grubbing, or disposal of cleared and grubbed materials shall include all costs for such work. No direct payment shall be made for clearing, grubbing, disposal of cleared or grubbed materials, excavation, trenching, disposal of surplus excavated material, handling water (and groundwater) and purchasing and hauling of required fill material. All excavation and trenching shall be unclassified as to materials which may be encountered; in addition, trenches shall be unclassified as to depth, unless otherwise stated.

1.05 LUMP SUM

A. For lump-sum items, payments shall be made to the Contractor in accordance with an accepted Progress Schedule of Values on the basis of actual work completed and accepted by the Owner at the final completion of the Project.

1.06 UNIT PRICE

A. For unit price items, payment shall be made based on the actual amount of work accepted by the Owner and for the actual amount of materials in place at the final completion of the Project, as confirmed by the final measurements.

B. After the work is completed and before final payment is made, the Engineer will make final measurements, with all required assistance from the Contractor, to determine the quantities of various items of work accepted as the basis for the final unit price payment.

1.07 PAYMENT FOR INCREASED OR DECREASED QUANTITIES

A. When alterations in the quantities of unit price work not requiring a Change Order(s), as herein provided for, are ordered and performed, the Contractor shall accept payment in full at the Contract unit price multiplied by the actual quantities of work constructed and accepted by the Owner at the completion of the project.

B. The actual percentage of each lump sum bid item completed by the Contractor and accepted by the Owner at the final completion of the Project will be paid to the Contractor.

1.08 DELETED ITEMS

A. Should any items contained in the Bid Schedule(s) be found unnecessary for the proper completion of the work contracted, the Engineer may eliminate such items from the Contract. This action shall in no way invalidate the Contract and no financial allowance or compensating payment for anticipated profit, overhead, etc., will be made for items so eliminated in making final payment to the Contractor.

1.09 PARTIAL PAYMENTS

A. Partial payments shall be made monthly as the work progresses. Partial payment shall be made subject to the provisions of the General and Supplementary Conditions.

1.10 PAYMENT FOR STORED MATERIAL DELIVERED TO THE PROJECT

A. When requested by the Contractor and at the discretion of the Owner, payment may be made for all or part of the value of acceptable materials and equipment to be incorporated into bid items, which have not been used, and which have been delivered to the construction site or placed in storage places acceptable to the Owner. The Contractor shall provide receipts for all stored material items requested for reimbursement which clearly identify the stored material item, where it is to be constructed, the unit cost of the item, as well as the total cost of the delivered item(s), the quantity of the item, the brand name of the item, and the supplier. Note that there are additional documentation requirements and storage requirements within the Contract Documents that must also be met before the Contractor can be reimbursed for these stored materials.

B. No payment shall be made for fuels, supplies, installation or connection hardware, lumber, false work, or other similar materials or on temporary structures or other work (items) of any kind which are not a permanent part of the Contract. Items having a value of less than $2,500 shall not be compensated for as a stored material item.

1.11 FINAL PAYMENT

A. If requested by the Engineer, the Contractor shall field verify all quantities in dispute by using visual observation, taped measurements, or other methods designated by the Engineer. The field verification shall be made in the presence of the Engineer and agreed to by both the Engineer and the Contractor. The Engineer will prepare a final adjusting Change Order which will adjust the final quantities of the project Bid Schedule to reflect the actual work accepted by the Owner and for which the Contractor will be compensated.

1.12 SCHEDULE OF VALUES

A. A schedule of values for the lump-sum bid items and some of the unit price bid items as required by the Engineer shall be submitted and accepted before the first pay request is approved by the Engineer. The schedule of values shall be based on the prices bid in the Bid Schedule(s). Prices bid in the Bid Schedule(s) cannot be changed in the schedule of values; they can only be broken down into more detail so that the Engineer can more accurately review and approve the Contractor’s pay application for the completed work.

1.13 MISCELLANEOUS CONSTRUCTION ITEMS

A. When pipe/service lines are constructed across a road, the road shall not be cut to perform this construction unless authorized in writing by the Engineer. Service

lines are to be bored, jack and bored, or horizontally directionally drilled (HDD) under the road. Jetting of water lines or water service lines will not be allowed.

B. The Contractor shall take all precautions necessary to protect existing utilities, roads, and miscellaneous items from damage during construction.

C. The Contractor shall repair, relocate, or replace existing utilities, roadways, and miscellaneous items to pre-construction conditions.

D. All repairs, relocations, and replacements necessary are considered incidental to the work and will be at the Contractor's cost, with no cost to the Owner.

E. The unit-price bid items and lump-sum bid items for all pipe items shall constitute full compensation for furnishing, laying, jointing, and testing of pipe; dewatering; excavation and backfill; and cleanup. All pipe lines, including but not limited to water lines, force mains, and gravity sewer lines, which are to be paid for per linear foot in the Bid Schedule, will be measured for payment only on a horizontal plane after installation, unless otherwise noted.

F. Payment for the water services, fire hydrants, and isolation valve bid items shall not be made until the associated Water Service Cards, Fire Hydrant Cards, and Isolation Valve Cards have been properly filled out, signed by the Contractor, and accepted by the Engineer as completed installations. Samples of the Water Service Card, Fire Hydrant Card, and Isolation Valve Card are located at the end of Specification Section 15110, Manual, Check, and Process Valves. The Contractor shall make all required copies of the cards for use in the work.

G. The Contractor shall have the City observe and document the installation of each underground fitting on the project. If the installation of any fitting is not confirmed and documented by the City, it shall not be paid for by the Owner.

PART 2 PAY ITEM DESCRIPTIONS

2.01 BID – NORTHSIDE PHASE 3 FORCE MAIN/WATER LINE EXTENSION

The descriptions provided in the following Paragraphs are to be used by the Bidder in preparing the Bid Schedule(s). They generally indicate how the major workscope items and their respective costs are to be separated into the line items listed in the Bid Schedule(s). These descriptions are not fully representative nor all-inclusive of the work required to complete the project in accordance with the Contract Documents. It is the Bidder's responsibility to include all required costs within the most appropriate line item(s).

BASE BID

Item 1. Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions (not to exceed 5% of the Base Bid)—This item shall include and cover the costs for performing construction; preparatory and overhead operations including but not limited to movement of personnel and equipment to and from the site; sanitary facilities; project administration and management; insurance; Owner and Engineer indemnification; temporary utilities; permits related to construction; performance and payment bonds in accordance with Florida Statutes 225.05; site safety and health program during the execution of the Construction Contract that complies with all local, state, and federal safety guidelines and laws; and all other similar activities and facilities necessary for executing this project. This lump-sum item shall not exceed 5% of the Base Bid amount. The Contractor will be paid 20% of this item upon completion of mobilization and 10% upon demobilization; the remainder will be prorated equally over the construction period.

Item 2. Traffic Control—The Contractor shall furnish all labor, signage, barricades, and other equipment necessary to provide traffic control in accordance with the Florida Department of Transportation (FDOT) Standard Specifications for all phases of work and all other maintenance of traffic plans as may be required by local, county, or state agencies. The Contractor will be paid 40% of this lump-sum item upon delivery and set up of the materials, and the remainder will be prorated equally over the construction duration.

Item 3. Environmental Protection—This item shall include but not be limited to all costs for providing a comprehensive environmental protection program for the project site and other areas as may be affected by the construction. This includes providing labor and materials necessary to prevent environmental damage to the ground, water, and air in conformance with all local, state, and federal laws. Examples include control of stormwater, erodible soils, noise, dust, pollutants, trash, waste, pumping discharge, and any other substance or activity that may adversely impact the environment. The Contractor will be paid 40% upon delivery and set up of the materials, and the remainder will be prorated equally over the construction period.

Item 4. Construction Survey and Layout—This item shall include all costs for providing the services of a Professional Land Surveyor to perform pre-construction stakeout; establish vertical control; and establish horizontal control, right-of-way locations, property boundary locations, and Record Drawing information verification and certification in accordance with the Contract Documents and to the satisfaction of the Owner. The Contractor will be paid 40% of this lump-sum item upon initial project layout, and the remainder will be prorated equally over the duration of construction.

Item 5. 6-Inch Sanitary Sewer Force Main via Open-Cut—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 6-inch sanitary sewer force mains installed by open cut as shown on the Drawings in accordance with the Contract Documents, including but not limited to all polyvinyl chloride (PVC) pipe, ductile iron (DI) pipe, DI fittings and connections, pipe restraints, end plugs, tracing wire, flushing of all

lines, connections, excavation, backfill, compaction, sodding/seeding, pressure testing, all associated appurtenances, and any other incidentals necessary for a complete and operable system as designed. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 6. 6-Inch Sanitary Sewer Force Main via Horizontal Directional Drilling (HDD)—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 6-inch sanitary sewer force main via HDD as shown on the Drawings in accordance with the Contract Documents, including but not limited to bore pits, piping, boring, reaming, back-reaming, slurry, slurry relief holes, installing the pipe in the bore, connections and transition couplings, high-density polyethylene (HDPE) reducers, HDPE fittings, removing or avoiding obstructions in the path of the HDPE pipe, existing utility coordination and relocation, excavation, backfill, compaction, sodding/seeding, site restoration, pressure testing, disinfection, disposal of soil (including disposal of soil/slurry mixture), and all associated appurtenances. Concrete, asphalt, or limerock repairs required specifically for the HDD installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 7. 12-Inch Potable Water Main via Open-Cut—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 12-inch potable water main via open-cut as shown on the Drawings in accordance with the Contract Documents, including but not limited to all PVC pipe, DI fittings and connections, pipe restraints, end plugs, fire hydrants, tracing wire, flushing of all lines, connections, excavation, backfill, compaction, sodding/seeding, landscape restoration, mailbox and other improvements restoration, existing utility coordination and relocation, pressure testing, bacteriological testing, all associated appurtenances, and any other incidentals necessary for a complete and operable system as designed. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe. No deduction in length will be made for the space occupied by valves or fittings. Concrete, asphalt, or limerock repairs required specifically for the open-cut water main installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid on a unit-price basis for each linear foot of water main installed complete as measured in place.

Item 8. 12-Inch Potable Water Main via HDD—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 12-inch potable water main via HDD as shown on the Drawings in accordance with the Contract Documents, including but not limited to bore pits, piping, bore, reaming, back-reaming, slurry, slurry relief holes, installing the pipe in the bore, connections and transition couplings, HDPE reducers, HDPE fittings, removing or avoiding obstructions in the path of the HDPE pipe, existing utility coordination and relocation, excavation, backfill, compaction, sodding/seeding, site restoration, pressure testing, disinfection, disposal of soil (including disposal of soil/slurry

mixture), and all associated appurtenances. Concrete, asphalt, or limerock repairs required specifically for the HDD installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 9. Combination Air/Vacuum Valves and Vaults—The Contractor shall furnish and install all labor, materials, equipment, and services for constructing and placing into operation combination air/vacuum valves and vaults as shown on the Drawings in accordance with the Contract Documents, including but not limited to combination air/vacuum valves, pipe saddles, corporation stops, pipe, fittings, isolation valves, gravel bedding, valve boxes, valve manholes with H-20 traffic covers, ARV enclosure, excavation, backfill, and appurtenances. The Contractor will be paid for each combination air/vacuum valve and vault installed complete as measured in place.

Item 10. Concrete Restoration—The Contractor shall furnish all labor, materials, equipment, and services for constructing the concrete restorations as shown on the Drawings in accordance with the Contract Documents, including but not limited to removing and disposing of existing concrete, surface preparation, earthwork, grading, fill, backfill, leveling (where required), concrete pavement, striping, marking, reflectors, and related appurtenances to the satisfaction of the Owner and the permitting agencies. The trench width will be paid according to the Specifications and detail widths. The Contractor will be paid on a unit-price basis for each square yard of concrete restored and installed complete as measured in place.

Item 11. Limerock Restoration—The Contractor shall furnish all labor, materials, equipment, and services for constructing the limerock restorations as shown on the Drawings in accordance with the Contract Documents, including but not limited to removing and disposing of or reusing existing limerock, surface preparation, earthwork, grading, fill, backfill, leveling (where required), and related appurtenances to the satisfaction of the Owner and the permitting agencies. The trench width will be paid according to the Specifications and detail widths. The Contractor will be paid on a unit-price basis for each square yard of limerock restored and installed complete as measured in place.

Item 12. Asphalt Concrete Restoration—The Contractor shall furnish all labor, materials, equipment, and services for constructing the asphalt restorations as shown on the Drawings in accordance with the Contract Documents, including but not limited to removing and disposing of existing asphalt, surface preparation, earthwork, grading, fill, backfill, prime and tack coats, leveling (where required), asphalt pavement, striping, marking, reflectors, and related appurtenances to the satisfaction of the Owner and the permitting agencies. The trench width will be paid according to the Specifications and detail widths. The Contractor will be paid on a unit-price basis for each square yard of asphalt concrete restored and installed complete as measured in place.

Item 13. Testing Allowance—The Contractor shall furnish all labor, materials, equipment, and services necessary for geotechnical in-place density testing of soils and pavement, concrete cylinder testing, and other testing as required by the Engineer and as specified in the Contract Documents. The Contractor will be reimbursed by the Owner for passing tests. Failed tests will not receive additional compensation.

Item 14. Record Drawings Allowance—The Contractor shall furnish all labor, materials, equipment, and services for composing and providing Record Drawings for the entire project in accordance with the Contract Documents, including but not limited to updating the electronic copy of the Drawings, identifying items that were revised during the project or addenda, having all Drawings signed and sealed by a Florida-certified Professional Land Surveyor, and providing signed-and-sealed paper copies of the Record Drawings. Once the Record Drawings have been determined by the Engineer to be complete according to the Specification requirements, the entire lump sum will be paid to the Contractor.

END OF SECTION

SECTION 01290
SCHEDULE OF VALUES

PART 1 GENERAL

1.01 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. To the Engineer, a proposed Schedule of Values allocated to the various portions of the Work, in accordance with Section 01000, Project Requirements, and Section 01200, Measurement and Payment.

B. Upon request of the Engineer, supporting data which will substantiate the values' correctness.

C. The accepted Schedule of Values shall be used only as the basis for the Contractor's Applications for Payment.

D. An update and resubmittal of the Schedule of Values when Change Orders affect the listing or when the actual performance of the Work involves necessary changes of substance to values previously listed and approved.

E. Schedule of Values

1. Submit typed schedule on EJCDC 1910-8-E forms provided by the Engineer. The Contractor's standard form or electronic media printout will be considered.
2. Submit Schedule of Values in duplicate within 10 days after the date of Owner-Contractor Agreement.
3. Format – Use the schedule of prices in the Bid Proposal. Show the cost breakdown for each lump-sum item. The lump-sum breakdown shall, at a minimum, use the Table of Contents of this manual outline. Identify each line item with the number and title of the major Specification Section. Identify site mobilization and demobilization, bonds and insurance, Record Drawings, photographs, and operations and maintenance manuals, etc.
4. For unit cost allowances, identify quantities taken from the Contract Documents multiplied by the unit cost to achieve the total for the item.
5. Include within each line item a direct proportional amount of the Contractor's overhead and profit.

6. Revise the schedule to list approved Change Orders with each Application for Payment.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 CASH ALLOWANCES

A. Costs Included in Allowances—The cost of the product to the Contractor or subcontractor, less applicable trade discounts and applicable taxes.

B. Costs Not Included in the Allowance, But Included in the Contract Price—Product handling at the site, including unloading, uncrating, and storage; protection of products from elements and from damage and labor for installation and finishing.

C. Contractor Responsibilities

1. Execute purchase agreement with designated supplier.
2. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
3. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

D. Differences between allowance amounts and actual costs will be adjusted by Change Order before final payment.

E. Cash Allowances Schedule

1. Testing.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01310
CONSTRUCTION COORDINATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall coordinate Work with that of other construction projects as needed.

B. Before starting Work and from time to time as the Work progresses, the Contractor and each subcontractor shall examine the work and materials installed by others as it applies to its own work and shall notify the Engineer immediately in writing if any conditions exist which will prevent satisfactory results in the installation of the system. Should the Contractor or subcontractor start work without such notification, it shall be construed as an acceptance of all claims or questions as to the suitability of the work of others to receive its Work. The Contractor shall remove and/or replace, at its own expense, all work under this Contract which may have to be removed on account of such defects or omissions.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. The Contractor shall ensure that all drawing, product data, and samples comply with Contract Documents and field dimensions and clearances.

B. The Contractor shall submit requests for interpretation of Contract Documents in a timely fashion to ensure there are no disruptions with the Work as scheduled. Obtain instructions through the Engineer to resolve all queries.

C. Process requests for substitutions and Change Orders through the Engineer.

D. Deliver close-out submittals to the Engineer.

1.03 WORK SEQUENCE

A. The Contractor shall submit a preliminary Progress Schedule, in accordance with Section 01320, Progress Schedule, to the Engineer. After review, the Contractor shall revise and resubmit the Progress Schedule to comply with requested revisions.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 CONSTRUCTION MOBILIZATION

The Contractor shall do the following:

A. Cooperate with the Owner in allocating mobilization areas on site for field offices and sheds, access, traffic, and parking facilities. During construction, the Contractor shall coordinate the use of the site and facilities through the Engineer.

B. Comply with the Engineer's procedures for intra-project communications: submittals, reports and records, schedules, coordination drawings, recommendations, and resolution of ambiguities/conflicts.

C. Comply with the Engineer’s instructions for use of temporary utilities and construction facilities.

D. Coordinate field engineering and layout work under instructions of the Engineer.

E. Coordinate scheduling, submittals, and work of the various Sections of Contract Documents to ensure the efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.

F. Coordinate the sequence of Work to accommodate the Owner occupancy as specified in the Contract Documents.

G. In addition to Progress Meetings specified in Section 01320, Progress Schedule, hold pre-construction conferences with personnel and Subcontractors to ensure coordination of Work. The Engineer shall be informed of such meetings and shall be allowed to attend.

H. Coordinate the Work of various sections having interdependent responsibilities for installing equipment, connecting equipment, and placing such equipment in service.

I. Coordinate the use of project space and the sequence of installing civil, mechanical, structural, instrumentation, systems, and electrical work. Follow practicable routings for pipes, ducts, and conduits, with due allowance for available physical space; make runs parallel with lines of building. Use space efficiently to maximize accessibility for other installations, maintenance, and repairs.

J. Coordinate Work at existing facilities to minimize disruption of the Owner's operations.

K. Assemble and coordinate close-out submittals specified in Section 01770, Project Closeout.

1.07 COORDINATION DRAWINGS

A. The Contractor shall provide information required by the Engineer for preparing coordination drawings.

B. The Contractor shall review drawings before submitting them to the Engineer.

1.08 CLOSE-OUT PROCEDURES

The Contractor shall do the following:

A. Notify the Owner when Work is considered ready for Substantial Completion.

B. Comply with the Owner's instructions to correct items of Work listed in executed Certificates of Substantial Completion.

C. Notify the Owner when Work has reached Final Completion.

D. Comply with the Owner's instructions for completing items of Work found incomplete in the Engineer's final inspection.

E. Comply with Section 01770, Project Closeout.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. All vehicles on the property or easement must be operational.

3.02 UTILITIES

A. The Contractor shall coordinate the activities of all utility companies with equipment in the construction area with the Contractor's and Subcontractor's Work.

3.03 CUTTING AND PATCHING

A. No cutting and patching of new Work will be accepted. All Work must be new and continuous in its final form.

END OF SECTION

SECTION 01320
PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. All work of this Contract shall be scheduled and monitored by the Contractor using the Critical Path Method (CPM) and shall use the Precedence Diagram Method (PDM) of scheduling. The Contractor shall prepare all schedules and all monthly updates described in this Section. The Contractor will prepare revisions of the schedule to reflect changes in the Contractor's plan of performance or changes in the Work and submit these revisions to the Engineer for acceptance. The Engineer's acceptance of the scheduling documents is to ensure that all CPM Scheduling documents prepared by the Contractor are in conformance with the Contract Documents and Specifications described herein. This acceptance will not impose on the Engineer or Owner the responsibility for the schedule or for the sequencing, scheduling, or progress of the Work, nor will the acceptance interfere with or relieve the Contractor of full responsibility for the schedule and the means, methods, procedures, and sequence of construction.

B. The Contractor shall use the latest version of Primavera Scheduling software, or an approved equal, for all CPM Scheduling applications.

C. The Engineer or Owner may retain the professional services of a CPM Scheduling Consultant to assist in the review and acceptance of the CPM Scheduling documents prepared by the Contractor. Therefore, any reference to the Engineer or Owner within this Section may also indicate the involvement of the Engineer's or Owner's CPM Scheduling Consultant.

D. The Contractor shall prepare and maintain a detailed progress schedule throughout the construction of the Project. The schedule shall be the Contractor's working schedule and be used to plan, organize, and execute the Work, record and report actual performance and progress, and show how the Contractor plans to complete the Work. The schedule will be in the form of an activity-oriented network diagram (CPM).

E. When the Contractor prepares the CPM Schedule and the schedule is accepted by the Engineer, it shall become part of the Contract Documents and will be used by Contractor and Engineer to monitor the progress of the Project. The CPM Schedule may be revised to show changes in the Contractor's method or manner of performance; delays, or authorized changes in the Work. All changes to the schedule will be made in accordance with Article 1.07 of this Section.

F. The Contractor acknowledges that free float belongs to the Owner.

1.02 PRELIMINARY 90-DAY CPM SCHEDULE

A. The Contractor shall develop a 90-Day CPM Schedule within 10 days after the date indicated in the Notice to Proceed. This schedule shall be a computerized CPM Schedule showing only the early start, early finish of each work activity. The 90-Day Schedule shall contain work activities over the first 90 days, and the estimated durations for each work activity shall be 15 workdays or less. The balance of the job shall be shown in summary log. The 90-Day Schedule shall include but not be limited to site work, hazardous material removal, demolition, key procurement activities (i.e. submissions, approvals, fabrication, and delivery), equipment, mechanical, electrical, and plumbing coordination and any other work that will occur during the first 90 days. This 90-Day Schedule shall become part of the Detailed CPM Schedule.

1.03 DEFINITIONS

The following terms used in this Section shall have the following meanings:

A. *Activity.* A fundamental unit of work in a CPM Schedule establishing the time and resources required for performing or furnishing a part of the Work or a requisite step. Each Activity has defined geographical boundaries, time duration in days, and a detailed estimate of resources required to construct the task. Each activity is assigned a unique description, activity number, activity code, and a dollar value.

B. *Record Schedule.* The Record Schedule will have actual start dates and actual finish dates for all work Activities and Milestones necessary to complete the Work.

C. *Baseline Schedule.* The Engineer-accepted Proposed Baseline Schedule. The Baseline Schedule is the Contractor's plan which has been approved by the Engineer for completion of the Work in compliance with the Milestones listed in the Contract Documents and within the Contract Time. The Baseline Schedule may be revised only by the Engineer's approval of a Contractor-produced adjusted Baseline Schedule. The Baseline Schedule for the Work is the sole basis for (a) the monitoring of the Contractor's progress against Milestones and the Contract Time; (b) calculating Total Float or Contract Float; and (c) the evaluation and reconciliation of extensions in Contract Time, if any. The first Baseline Schedule shall be designated by all parties as the Baseline Schedule, Rev. 0. When Baseline Schedules are adjusted by the Contractor and approved by the Engineer, they shall be designated as Baseline Schedule, Rev. 1, 2, 3, etc. (as appropriate) and shall replace the previously approved Baseline Schedule.

D. *Contract Float.* Workdays between the Contractor's expected date for early completion of the Work, or specified part, and the corresponding Contract Time.

E. *CPM Network.* The structure of the computerized schedule. The CPM Network accounts for the entire Work and defines the construction logic in terms of all of the Activities with their logical dependencies.

F. *Critical Path.* A series of Activities linked by dependencies that determine the shortest possible time to complete the Work.

G. *Early Dates.* The early start dates and early finish dates, i.e., the dates each Activity will start and finish if each is started at the earliest end of the range of dates that the CPM indicates the Activities can be performed.

H. *Excusable Delay.* An unforeseeable delay, beyond the control of the Contractor, experienced due to no fault or negligence by the Contractor, its subcontractors, or suppliers.

I. *Free Float.* The amount of time that any activity can be delayed without adversely affecting the early start of the following activity.

J. *Fragnet.* A predefined or individual segment of a network which represents a specified sequence of the Work. Fragnets shall be submitted which include all Activities, required resources, and costs and shall be submitted to the Engineer for approval of all Change Orders before their incorporation into the Baseline Schedule by the Contractor. A Fragnet shall be submitted before approval of any proposed logic changes. Fragnets are banded Activities representing a revised portion of the Baseline Schedule and shall be logically connected and constrained by previously existing predecessor and successor Activities, as applicable.

K. *Late Dates.* The late start dates and the late finish dates; i.e., the dates each Activity will start and finish if each is started at the latest end of the range of dates that the CPM Network indicates the Activities can be performed and still achieve the Milestones and Contract Time.

L. *Milestone.* A point of progress designated for the purpose of establishing start or finish times for a key aspect of the Work.

M. *Predecessor Activity.* An Activity which precedes another Activity (to which it is logically tied) in the CPM Network.

N. *Preliminary Schedule*. The Contractor's Baseline Schedule for the first 180 days of the Contract.

O. *Proposed Baseline Schedule.* The Proposed Baseline Schedule shall represent the Contractor's plan for completion of the Work in compliance with Milestones listed in the Contract Documents and within the Contract Time. It represents the Contractor's first complete planned schedule submitted for review and approval by the Engineer. The Proposed Baseline Schedule shall take into account all foreseeable activities to be accomplished by any separate contractors, utility owners, or the Owner's operations. The Proposed Baseline Schedule shall anticipate all necessary manpower and resources to accomplish activities within the durations set forth in the Proposed Baseline Schedule. The Proposed Baseline Schedule shall address and indicate all submittals required by the Contract and indicate the times allowed for review, resubmittal, and approval of submittals. Upon approval by the Engineer, the first Proposed Baseline Schedule shall become the Baseline Schedule, Rev. 0.

P. *Resource Loading.* The allocation of work force and equipment necessary for the completion of an Activity as scheduled.

Q. *Six-Week Schedule.* A detailed progress schedule taken from the Working Schedule, which discloses the plan for the next 6 weeks' Work and the actual schedule for the previous 6 weeks' Work.

R. *Successor Activity.* An Activity which follows another Activity (to which it is logically tied) in the CPM Network.

S. *Total Float.* The number of workdays by which a part of the Work in the Baseline Schedule or Revised Baseline Schedule may be delayed from its Early Dates without necessarily extending the Contract Time.

T. *Working Schedule.* When the Proposed Baseline Schedule (or a subsequent adjustment is made by the Contractor to the Baseline Schedule) is accepted by the Engineer and becomes the Baseline Schedule, Rev. 0, 1, 2, 3, etc., it shall be duplicated and become the Working Schedule. The Contractor shall update the Working Schedule monthly with a Data Date designated by the Engineer. The Working Schedule shall be updated monthly to reflect actual progress only and shall be the basis for determining monthly progress payments and the Contractor's performance in relation to the most recently approved Baseline Schedule. The Final Working Schedule shall be the Record Schedule.

1.04 DETAILED CPM SCHEDULE

A. The Detailed Network Diagram shall provide sufficient detail and clarity of form and technique so that the Contractor can plan, schedule, and control his work properly and the Engineer can readily monitor and follow the progress for all

portions of the Work. The Detailed Network Diagram shall comply with the Contract Times of the Agreement and various limits imposed by the Contract Documents, including required sequencing of portions of the Work described in Section 01100, Summary of Work. The degree of detail shall be to the satisfaction of the Engineer, but the following factors shall have a bearing on the required depth of activity detail:

1. The structural breakdown of the Project.
2. Project phasing and/or milestones.
3. The type of work to be performed and the labor trades involved.
4. All purchase, manufacture, and delivery activities for all major materials and equipment.
5. Maintenance of facilities in operation.
6. Submittal and approval of shop drawings and material samples.
7. Plans for all subcontract work.
8. Crew flows and sizes.
9. Assignment of responsibility for performing all activities.
10. Access and availability to work areas.
11. Identification of interfaces and dependencies with preceding, concurrent, and follow-on subcontractors and contractors.
12. Testing and start-up of systems.
13. Planning for phased takeover by the Owner.

B. Activities shown shall be in workdays and shall have a maximum duration of 5 days, except in the case of non-construction activities such as procurement of materials and delivery of equipment. All durations shall be the result of definitive manpower and resource planning by the Contractor.

C. The Detailed Network Diagram shall be prepared using a computer plotter.

1.05 COMPUTERIZATION OF THE DETAILED CPM SCHEDULE

A. The mathematical analysis of the Detailed Network Diagram shall be made by computer, and a tabulation for each activity shall include the following:

1. Unique event numbers.
2. Activity descriptions.
3. Durations in workdays for each activity.
4. Earliest start date (by calendar date).
5. Earliest finish date (by calendar date).
6. Latest start day (by calendar date).
7. Latest finish day (by calendar date).
8. Slack or total float in workdays.
9. Percentage of activity completed.

B. The following computer outputs shall be prepared as part of the initial schedule submission and each update thereafter:

1. Activity file sort.
2. Eight-week “Look Ahead” detailed bar chart.
3. Summary bar chart.
4. Additional computer sorts to the schedule as required by the Owner.

1.06 COMPLETION REQUIREMENT

A. The 90-Day Schedule shall be completed within 10 calendar days after the date indicated in the Notice to Proceed.

B. The Detailed CPM Schedule shall be prepared within 30 calendar days after the date indicated in the Notice to Proceed.

C. If the Contractor fails to provide the required CPM scheduling documents to the Engineer within the time prescribed and/or revisions of the scheduling documents within the required time, the Contractor shall be in default of the Contract requirements and the Engineer may withhold approval of progress payments until such time as the Contractor submits the required information.

D. Notwithstanding the implementation of the Progress Schedule, it shall be the sole responsibility of the Contractor to complete the Work within the time of completion required by the Contract.

1.07 UPDATINGS

A. The 90-Day CPM Schedule shall be updated monthly until the Engineer accepts the Detailed CPM Schedule.

B. The first update of the Detailed CPM Schedule shall take place 60 calendar days after the Notice to Proceed with subsequent updates performed monthly at the jobsite for the duration of the Contract.

C. The Contractor shall update the Detailed CPM Schedule monthly, using a cutoff/ data date agreeable to the Contractor and the Engineer. This cutoff/data date shall be consistent from month to month. The update information shall include but not be limited to the following:

1. Actual start dates.
2. Actual completion dates.

3. Activity percent completion.
4. Remaining duration of activities in progress.

D. The Contractor shall update all the scheduling documents and submit these documents to the Engineer within 5 workdays of the cutoff/data date.

E. The Contractor shall submit seven copies of the CPM schedule and one electronic copy of the CPM schedule on a CD.

F. As part of the normal CPM update, the Contractor shall prepare a written narrative report highlighting the progress during the past update period. The written narrative report shall include but not be limited to the following information:

1. Summary of work accomplished during the past update period.
2. Milestone Comparison Chart.
3. Analysis of Critical Path(s).
4. Analysis of Secondary Critical Path(s). Secondary Critical Path is defined as float within 10 workdays of Critical Path.
5. Analysis of time lost/gained during the update period.
6. Identification of problem areas.
7. Identification of change orders and/or any delay that is impacting/delaying the project schedule.
8. Solutions to current problems.

G. The Contractor is required to attend and participate in a CPM update review meeting with the Engineer. Attendance is mandatory. This meeting will take place 7 workdays after the cutoff/data date, or during progress meetings as decided by the Owner and the Engineer. The purpose of this meeting is to review past progress, current status, problem areas, and future progress. The Contractor's narrative report will be reviewed at this meeting.

H. All schedule update information outlined above will be reviewed and accepted by the Engineer.

1.08 RECOVERY SCHEDULE

A. If the Contractor fails to achieve the planned progress, as indicated in the approved/updated detailed CPM Schedule, and the Contractor's lack of progress delays the Critical path and/or an intermediate milestone by more than 10 workdays (monthly or cumulatively), the Contractor shall submit to the Engineer for review and acceptance a proposed Recovery Schedule indicating how the Contractor will recover the time lost.

B. If the Contractor fails to submit a Recovery Schedule and/or fails to cooperate with the Engineer in the Recovery Schedule process, the Owner can immediately order the Contractor to accelerate completion of the late activities which have been delayed by whatever means necessary without any additional costs to the Owner. The Owner can withhold future progress payments until the Contractor's progress is in compliance with the Contract Schedule or until the Owner has approved by Change Order proposed adjustments to the contract milestones, extension of contract time, or modification of the Contract Schedule.

1.09 CHANGE ORDERS, DELAYS, AND EXTENSIONS OF TIME

A. When proposed Change Orders, approved Change Orders, or any delays are experienced and the Contractor believes the Change Order/Delay is causing delay to an intermediate contract milestone or to the project completion, the Contractor shall submit to the Engineer a Time Impact Analysis, explaining the influence of each Change Order/Delay on the current updated Contract CPM Schedule. The Contractor shall prepare a "Fragnet" (network analysis) of each Change Order/Delay on the current updated Contract CPM Schedule. The analysis will demonstrate the time impact based on the date the change is given to the Contractor, the status of construction at that point in time, and the event time computation of all affected activities. The event times used in the analysis shall be those included in the latest updated copy of the detailed CPM Schedule closest to the time of delay or as accepted by the Engineer.

B. For the Contractor to be entitled to an extension of Contract time to an intermediate contract milestone and/or to the project completion, the Time Impact Analysis must show that the Change Order/Delay impacts the intermediate contractual milestone date and/or the updated CPM Schedule's Critical Path, thereby directly impacting the project completion date. Change Orders/Delays that do not impact intermediate contractual milestones and/or the critical path and impact activities with float will not be considered as a delay to the project and no extension of time will be granted.

C. The Contractor must submit a written analysis within 7 calendar days after a delay occurs or authorized change in work is given to the Contractor. If the Contractor does not submit a written analysis for specific Change Order(s) or Delay(s) within the specified period of time, then it is mutually agreed that the particular Change Order of Delay has no time impact on the Project CPM Schedule and no time extension is required.

D. The Engineer will accept or reject each Time Impact Analysis within 14 calendar days after submittal unless subsequent meetings and negotiations are necessary. Upon the Engineer's acceptance, the Contractor will incorporate fragnets

illustrating the influence of the Change Orders and Delays into the Detailed CPM Schedule during the first update after agreement is reached.

1.10 PROGRESS MEETINGS

A. The Owner will conduct progress meetings at least once per month to discuss the progress of the Work. The Contractor and any subcontractors the Contractor deems necessary shall attend these meetings. At the Owner's discretion, the frequency of the meetings may be increased if the progress of the Work is not satisfactory or if coordination problems should arise.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01325
CONSTRUCTION PHOTOGRAPHS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall have digital pictures, photographs, and DVDs made of the Work from views and at such times as directed by the Engineer. These photographs shall represent a visual history of the Project, from Contract Award through Contract Completion.

B. The Contractor shall take a preconstruction video of the entire site, including the areas of adjacent properties within 100 feet of the limit of Work. Special effort shall be made to show the existing paved roads, shoulders, signs, and other existing features.

C. The Contractor shall also use electronic "snap-shot" photography as necessary to record and facilitate resolution of on-site issues through the transmission of electronic photographs by e-mail from the site to the Engineer's and Owner's offices.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS

2.01 PRODUCTS

A. Photographs and digital pictures shall be in color. Provide one copy of each digital picture on each of three CDs.

B. Provide photographs taken of each of the major items during construction.

C. View and Quantities Required: A minimum of 30 images per month clearly showing project status and key elements of construction.

D. Deliver electronic images supplied on USB storage media to the Engineer with every pay request.

PART 3 EXECUTION

3.01 VIEWS REQUIRED

A. Photographs shall be from locations to illustrate the condition of construction and the state of progress adequately.

B. The Contractor shall provide before and after photographs of each portion of the site. The below-ground facilities shall include all equipment, walls, floor, piping, supports, and entrance. At major locations photographs shall include before, during, and after photographs and all photographs shall be organized by ascending date order to show the Work as it progresses.

3.02 DESCRIPTIVE INFORMATION

A. Each photograph shall have a permanent title block on the back and shall contain the typed information and arrangement as follows:

COMPLETE PROJECT NAME
Contract No.

CONTRACTOR:	(Name of Contractor)
DATE:	(When Photo was Taken)
PHOTO NO.:	(Consecutive Numbers)
PHOTO BY:	(Firm Name of Photographer)
LOCATION:	(Description of Location and View)

B. The Contractor shall provide the Engineer with a written description of each photograph. This description shall be included in the binders and a copy shall be submitted with the CDs. The Field Engineer or inspector shall approve the description.

3.03 VIDEOTAPE REQUIREMENTS

A. Major Locations

1. The Contractor shall provide color digital video of each major facility and structures and facilities adjacent to the construction before construction starts, during construction, and when construction has been completed.

Approximately every 2 weeks, 15 minutes of digital video shall be submitted to the Engineer showing Work completed, Work in progress, Work started, and problems which occurred since the last taping. The Contractor shall maintain the master video CD ROM of each portion of the facility on the Work site. The master video shall be a running chronicle of construction progress. The Contractor shall combine the bi-weekly video onto the master video. The bi-weekly video shall be submitted to the Engineer within 10 working days after recording and the bi-weekly videos may include multiple locations.

2. All videos shall be recorded with character generator operating with date, time, and location on screen. During video recording, the Contractor shall narrate the video, explaining what is being shown, the problem that has occurred, and what is being done. All videos shall be delivered to the Engineer before Final Completion is submitted.

3.04 DIGITAL PHOTO DOCUMENTATION

A. Catalog and manage Electronic “snap-shots” and images of photographs in a secure digital photo management system capable of being linked to the project schedule and document management database. Add captions, descriptions, and key words. Transfer a copy of all “snap-shots” and photos with their related notes, keywords, captions, and activity IDs to the Engineer weekly.

B. All photographs shall be clear, sharp, and free of distortion after enlargement. Each photograph shall have a permanent title block in the lower right-hand corner which shall be 2 1/2 inches high by 6 inches wide and shall contain the information and arrangement as described in Paragraph 3.02.A above.

END OF SECTION

SECTION 01330
SUBMITTALS AND ACCEPTANCE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall submit documentation that describes the Work to be performed under the Contract as required in this Section. This documentation will be for the Engineer and Owner's review and use. The documentation furnished by the Contractor must enable the Engineer and Owner to verify the Contractor's performance and compliance with Contract requirements. The documentation shall cover all services and deliverables required and secured by the Contract Documents.

1.02 SUBMITTALS

A. General—The Contractor shall submit the following:

1. Project documentation: For the Engineer and Owner's internal use and shall include all information that will be essential for the facility's operations, maintenance, training, and repair of equipment and facilities supplied by the Contractor. The Contractor shall submit all documentation necessary to ascertain compliance with technical/contractual provisions.

2. Shop drawings: Drawings, schedules, diagrams, warranties, and other data prepared specifically for this Contract by the Contractor or through the Contractor by way of subcontractor, manufacturer, supplier, distributor, or other lower-tier contractor to illustrate a portion of the Work.

3. Product data: Preprinted materials such as illustrations, standard schedules, performance charts, instructions, brochures, diagrams, manufacturer's descriptive literature, catalog data, and other data to illustrate a portion of the Work, but not prepared exclusively for this Contract.

4. Samples: Physical examples of products, materials, equipment, assemblies, or workmanship that are physically identical to portions of the Work, illustrating portions of work, or establishing standards for evaluating appearance of finished work or both.

5. Administrative submittals: Data presented for reviews and acceptance to ensure that administrative requirements of the project are adequately met

but not to ensure directly that work is in accordance with the design concept and in compliance with Contract Documents.

6. Mockups: Before installing work requiring mockups, the Contractor shall build mockups for each form of construction and finish required using materials indicated for the completed Work, as follows:

    a. Build mockups in the location and of the size directed by the Engineer.
    b. Notify the Engineer 7 days in advance of dates and times when mockups will be constructed.
    c. Demonstrate the proposed range of aesthetic effects and workmanship.
    d. Obtain the Engineer’s acceptance of mockups before starting work, fabrication, or construction.
    e. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
    f. Demolish and remove mockups when directed by the Engineer.

B. Coordination

1. Submittals and schedules shall be checked and coordinated with the Work of all trades involved before they are submitted and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the Contractor for resubmission.

C. Start of Work

1. Within 30 calendar days after the notice to proceed for the project, the Contractor shall submit to the Engineer a Contract Data Requirements List that defines all data to be submitted under this Contract. Included in this list shall be the names of all proposed manufacturers furnishing specified items to the extent known. Review of this list by the Engineer shall in no way relieve the Contractor from providing materials, equipment, systems, and structures fully in accordance with the Specifications.

D. General Requirements

1. The Contractor shall prepare, assemble, and submit all documents as described herein. The Contractor shall submit certification that the documents prepared conform to the Contract requirements and will result in a complete and operable project. The Engineer and Owner shall review

the Contractor's documents for conformance to the Contract requirements and may comment on the documents.

2. The Contractor shall approve and certify all project documents. The Contractor's failure to certify the documents or failure to provide documents that demonstrate conformance to the Contract requirements are grounds for rejection. The Contractor shall be responsible for and bear all costs for proceeding with any part of the Work that fails to meet the Contract requirements.
3. Submittal of documents for the Engineer's review shall in no way relieve the Contractor of full responsibility for providing a complete, safe, reliable, operating, and coordinated Work (system/equipment/facilities) that is in compliance with these Contract documents.

E. Requests for Substitution

1. All requests for substitution shall clearly and specifically indicate any and all differences or omissions between the products specified as basis of design and the product proposed for substitution. Data shall include but not be limited to differences as follows for both the specified and substituted products:

    a. Principle of operation.
    b. Materials of construction or finishes.
    c. Thickness or gauge of materials.
    d. Weight of item.
    e. Deleted features or items.
    f. Added features or items.
    g. Changes in other work caused by the substitution.
    h. If the substitution contains differences or omissions not specifically called to the attention of the Engineer, the Engineer reserves the right to require equal or similar features to be added to the substituted product at the Contractor's expense.

F. Submittal Requirements and Procedures

1. Drawing Formats and Requirements

    a. Drawings—All Drawings and Shop Drawings shall be prepared on 22-x-34-inch paper and shall have a blank area of 3 x 4 inches in the lower right hand corner above the title block. Each Drawing shall indicate the following information in the title block:

        (1) Title and Drawing Number.
        (2) Date of Drawing or Revision.

(3) Name of Building or Facility.
(4) Name of Contractor or subcontractor.
(5) Drawing contents and locations.
(6) Specification Section and Subsection Numbers.

b. Required Copies—All drawings submitted shall have a minimum of eight copies distributed in the following way:

(1) 2—Owner.
(2) 4—Jones Edmunds.
(3) 2—Returned.

2. Product Data

a. Requirements—Product data shall include all catalog cuts, performance surveys, test reports, equipment lists, material lists, diagrams, pictures, and descriptive material. All product data shall be submitted on either 8.5-x-11-inch or folded 11-x-17-inch size paper of 20-lb (9.072 kg) weight. The submittal information shall show the standard and optional product features, as well as all performance data and specifications. The manufacturer's recommendation for special tools shall be supplied.

3. Samples—The Contractor shall furnish samples required by the Contract Documents, for review by the Engineer. Samples shall be delivered to the Engineer as specified or directed.

a. All samples shall be of sufficient size and quantity to illustrate clearly the functional characteristics of the product, with integrally related parts and attachment devices. The samples shall show the full range of color, texture, and pattern.
b. The Contractor shall submit a minimum of four samples of items submitted. All samples shall be marked with required submittal information, as specified above.

4. Color, Texture, and Pattern Charts

a. The Contractor shall submit color, texture, or pattern charts of all required finishes.
b. A minimum of four charts of each item shall be submitted.

5. Submittal Information Requirements

a. When used in the Contract Documents, the term "Submittal Information" shall be considered to mean the following information at a minimum:

(1) Contract Name.
(2) Contract Number.
(3) Location within Facility.
(4) Date Submitted.

b. Drawings—The Contractor shall mark submittal information on all Drawings in the left half of the 4-x-3-inch block as described above.

c. Product Data and Manufacturer's Literature—The Contractor shall mark all product data and manufacturer's literature with submittal information and note which item is being furnished. The Contractor shall mark the option and supplies to be furnished with the item. At least one original manufacturer product data sheet must be submitted; the balance can be copied. Do not submit the manufacturer's general catalog: submit only items being installed or delivered. When manuals are being submitted, the Contractor shall mark submittal information on both the cover and title page. If manuals being submitted contain more than just one item, each item must be marked and only Contract name and number is to be marked on the cover and title page.

6. Training, Operation and Maintenance Manuals

a. The Contractor shall submit to the Engineer for review and acceptance of manufacturer's installation, operations, lubrication, maintenance, and training manuals for all equipment installed or delivered under this Contract. All manuals shall have submittal information marked on the front cover, title page, and three places inside the manual. If the manual being submitted is for different components, mark the front cover and title page only. Each component section must be marked with the Specification Section and subsection numbers. Operations and Maintenance Manuals shall conform to requirements defined in Section 01830, Operations and Maintenance Manuals.

G. Required Submittals

1. Structural Submittals

a. This Section specifies general procedural requirements for contractual submittals for the following structural schedules, product data, samples, and manufacturer's certificates.

(1) Product Data—The Contractor shall provide product data for all structural items, options, and other data and provide supplemental manufacturer's standard data for information unique to the Work and installation. The submittals shall reflect all items delivered or installed under this Contract.
(2) Samples—The Contractor shall provide all samples required under this Specification including color charts and product samples.
(3) Material, equipment, and installation and demolition Specifications.

2. Mechanical and Electrical System Submittals

a. This Section specifies general procedural requirements for mechanical schedules, performance data, control diagrams, and other submittal data.

b. The Contractor shall submit the following:

(1) Performance Data.

(2) Power and Riser Diagrams—Single line riser, power diagrams, and all conduit runs shall be provided for all equipment and facilities.

(3) Wiring Diagrams—Elementary controls diagrams and separate wiring diagrams for mechanical and electrical unit/subsystem. Drawing for starting and shutdown of equipment including controls shall be provided, including a comprehensive description of operation.

(4) Finished Data—Complete surface preparation and finished data for all mechanical and electrical unit/subsystems shall be provided, including a complete list of cleaning instructions.

(5) Factory Testing—Detailed description of factory testing procedures, reporting procedures and criteria for test passing or failing shall be provided for all mechanical and electrical units/subsystems. Testing shall comply with the General Requirements and Technical Requirements Sections.

(6) Site (Field) Testing and Acceptance—Detailed description of site testing and acceptance tests including descriptions of procedures, testing equipment, reporting procedures, and criteria for passing or failing tests shall be provided for all mechanical and electrical units/subsystems. Testing shall comply with General Requirements and Technical Requirements.

(7) Factory Test Report—After fabrication and testing, the Contractor shall submit the results of tests. No shipment of any mechanical and electrical unit/subsystem shall be allowed without the written certification from the Contractor that the equipment conforms to the Contract requirements.

(8) Site Test and Acceptance Report—Site test and acceptance reports shall be submitted to the Owner and Engineer.

(9) Operations and Maintenance Manuals—The Contractor shall furnish manuals for all mechanical and electrical equipment specified under this Contract. Each manual shall include the following at a minimum:

(a) Description of equipment.
(b) Record shop drawing.
(c) Operation and maintenance instructions.
(d) Part lists.
(e) Equipment ratings.
(f) Valve list.
(g) Lubrication instructions.

c. Compliance with this Section does not relieve the Contractor from compliance with the requirements of Section 01830, Operations and Maintenance Manuals.

H. Submittal Review

1. The Engineer's review of the Contractor's documents shall not relieve the Contractor of the responsibility for meeting all of the requirements of the Contract nor of the responsibility for correcting the documents furnished. The Contractor shall have no claim for additional cost or extension in time because of delays due to revisions of the documents that may be necessary for ensuring compliance with the Contract.

2. The Engineer will review a submittal or re-submittal once, after which the cost of review shall be borne by the Contractor. The cost of Engineering shall be equal to the Engineer's full cost.

3. No partial submittals will be reviewed. A submittal or re-submittal not complete will be returned to the Contractor for completing and re-submittal.

4. Documents submitted by the Contractor for approval by the Engineer will be returned bearing a project-specific stamp bearing the dated signature of the reviewer and one of four boxes checked:

   a. NO EXCEPTIONS NOTED—This indicates that the submittal appears to be in compliance with the requirements of the performance specifications and that the Work may proceed.
   b. MAKE CORRECTIONS NOTED—This indicates that the reviewer has added a minor correction to the submission and that the Work (modified in accordance with the correction comment) may proceed. The Contractor shall accept the responsibility of the modified document and resulting Work with no additional compensation.
   c. AMEND AND RESUBMIT—This indicates that the submittal will require Contractor modifications based on the reviewer's comments that accompanied the returned submittal. The Contractor will be cautioned that work may not proceed under this review status.
   d. REJECTED—This indicates that the submittal is not in conformance with the requirements of the performance Specifications and cannot be modified to gain compliance. A new submittal will be required in the instance of a "reject" status and the Contractor will be cautioned that work may not proceed under this condition.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SUBMITTAL PROCEDURES

A. Before submitting documents for the Engineer's review, the Contractor shall review the documentation for conformance to the Contract requirements. Submittals shall be complete and comprise a logical division of the Contract Work.

B. All documentation submitted by the Contractor to the Engineer shall be accompanied by a letter of transmittal and shall be submitted in a sequence that allows the Engineer to have all of the information necessary for checking and accepting a particular document at the time of submittal.

C. Each document shall be identified by a document number, Contract number, Contract name, location, Specification Section, subsection numbers, and submittal date. Where a manual/drawing is revised to reflect a change in design or a change for any other reason, each such revision shall be shown by a revision number, date, and subject in a revision block. Indication of official approval by the Contractor's Project Manager shall also be included. To permit rapid location of the revision, additional notation shall be made in the manual opposite the line or area where the change was made and identified by the corresponding revision number.

3.02 DOCUMENTATION CONTROL AND SUBMITTAL SEQUENCING

A. The Contract Data Requirements List shall be updated and resubmitted to the Engineer monthly, throughout the duration of the Contract. This list shall identify the Contractor's submittal number, proposed and actual submittal date, Contract Specification Section Number, Paragraph, Item of the Work, and type of document.

B. The Contractor shall work with the Engineer to provide a regulated flow of submittals that allows the Engineer to review the submittals in the defined time frame without undue delays. Monthly the Contractor shall provide the Engineer a schedule of the approximate quantities and delivery dates for all submittals due for the next 120 days.

3.03 FINAL RECORD DRAWINGS

A. The Contractor shall submit the Final Record Drawing Package to the Engineer for review at Substantial Completion. The Contractor shall be provided with CADD files, AutoCAD in the version specified by the Engineer. Final Record Drawings shall be printed on 22-x-34-inch sheets and on CDs, in AutoCAD. The Contractor may request to use a different version, but it must be approved by the Engineer. Record Drawings shall be in accordance with Section 01785, Record Documents.

3.04 REQUIREMENTS FOR SUBMITTAL

A. Additional documents, drawings, interface data, and other pertinent project submittal data are listed in specific sections of this Contract.

3.05 RECORD PRINTS

A. The Contractor shall submit one set of all record prints before final completion. The record print or project records shall include submittals, catalog cuts, drawings, calculations, test reports, manufacturer's data, maintenance manuals, installation instructions, and operating manuals. All "record prints" shall be delivered to the Engineer in three-ring binders with dividers and shall be placed in order by Specification Section.

END OF SECTION

SECTION 01350
ENVIRONMENTAL PROTECTION PROCEDURES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Work covered by this Section consists of furnishing all labor, materials, and equipment and performing all work required for the prevention of environmental pollution in conformance with applicable laws and regulations during and as the result of construction operations under this Contract. In this Section *environmental pollution* is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare, unfavorably alter ecological balances of importance to human life, affect other species of importance to man, or degrade the utility of the environment for aesthetic and/or recreational purposes.

B. The control of environmental pollution requires considering air, water, and land and involves managing noise and solid waste as well as other pollutants.

C. The Contractor shall schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the Work. The Contractor shall provide erosion-control measures such as diversion channels, sedimentation or filtration systems, berms, staked synthetic bales, seeding, mulching or other special surface treatments that are required to prevent silting and muddying of streams, rivers, impoundments, lakes, etc. All erosion-control measures shall be in place in an area before any construction activity in that area.

D. This Section is intended to ensure that construction is achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings. These are general guidelines. It is the Contractor's responsibility to determine the specific construction techniques to meet these guidelines.

E. All phases of sedimentation and erosion control shall comply with and be subject to the laws of the State of Florida and the Project Environmental Resource Permit.

1.02 SUBMITTALS

A. The Contractor shall prepare a sedimentation and erosion-control drawing meeting the requirements of the law and furnish two copies of the approved Drawing to the Engineer.

1.03 WORK SEQUENCE

A. Before beginning the Work, the Contractor shall meet with the Engineer to establish agreed-upon compliance with these provisions and administration of the environmental pollution control program.

B. The Contractor shall remove temporary environmental control features when approved by the Engineer and incorporate permanent control features into the project at the earliest practicable time.

1.04 REFERENCE STANDARDS

A. Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. Where this Section differs from these documents, the requirements of this Section shall apply.

B. The Contractor shall comply with all applicable Federal, State, and local laws and regulations concerning environmental pollution control and abatement.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EROSION CONTROL

A. The Contractor shall provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion-control measures, such as siltation basins, check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Surface water shall be prevented from flowing into excavated areas. Ditches shall be used around the construction area to carry away water resulting from dewatering excavated areas. At the completion

of the Work, ditches shall be backfilled and the ground surface restored to its original condition.

3.02 PROTECTION OF STREAMS AND SURFACE WATERS

A. Care shall be taken to prevent or reduce to a minimum any damage to any stream or surface water from pollution by debris, sediment, or other material or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing or that contains oils or sediments that will reduce the quality of the water in the stream shall not be directly returned to the stream. Such waters shall be diverted through a settling basin or filter before being directed into streams or surface waters.

B. The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water, or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.

C. All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action plan approved by the Florida Department of Environmental Protection and the US Environmental Protection Agency. The Contractor shall submit two copies of approved contingency plans to the Engineer.

D. Water being flushed from structures or pipelines after disinfection with Cl_2 shall be treated with a dechlorination solution approved by the Engineer before discharge.

3.03 PROTECTION OF LAND RESOURCES

A. After completion of construction, the Contractor shall restore land resources within the project boundaries and outside the limits of permanent work to a condition that will appear to be natural and not detract from the appearance of the project. All construction activities shall be confined to areas shown on the Drawings.

B. Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, the Contractor shall first wrap the trunk with a sufficient thickness of burlap or rags over which

softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.

C. The Contractor shall protect trees that may possibly be defaced, bruised, injured, or otherwise damaged by the construction equipment, dumping, or other operations by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly.

D. Any trees or other landscape features scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to their original condition. The Owner will decide the method of restoration to be used and whether damaged trees shall be treated and healed or removed and disposed of.

1. All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 1inch in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.
2. Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and, in the opinion of the Owner, are beyond saving shall be immediately removed and replaced.

E. The Contractor’s storage and other construction buildings required temporarily in the performance of the work shall be located in cleared portions of the job site or areas to be cleared as shown on the Drawings and approved by the Engineer and shall not be within wetlands or floodplains. Preserving the landscape shall be required in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for the Engineer’s approval.

F. If the Contractor proposes to construct temporary roads or embankments and excavations for plant and/or work areas, the Contractor shall submit the following for approval at least 10 days before the scheduled start of such temporary work:

1. A layout of all temporary roads, excavations, embankments, and drainage to be constructed within the work area.
2. Details of temporary road construction.
3. Drawings and cross-sections of proposed embankments and their foundations, including a description of proposed materials.
4. Landscaping drawings showing the proposed restoration of the area. The proposed removal of any trees and shrubs outside the limits of the existing clearing area must be indicated. Locations of guard posts or barriers required to control vehicular traffic and protect trees and shrubs to be

maintained undamaged must also be indicated. The drawings shall provide for the obliteration of construction scars as such and shall provide for a natural appearing final condition of the area. Modification of the Contractor's approved drawings shall be made only with the written approval of the Engineer. No unauthorized road construction, excavation, or embankment construction including disposal areas will be permitted.

G. The Contractor shall remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling, and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation within the roadway areas. The disturbed areas shall be prepared and seeded as approved by the Engineer or Owner.

H. All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.

3.04 PROTECTION OF AIR QUALITY

A. Burning—Burning will not be permitted at the project site for the disposal of refuse and debris.

B. Dust Control—The Contractor shall maintain all excavations, embankment, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or outside the project boundaries free from dust which could cause the standards for air pollution to be exceeded and which would cause a hazard or nuisance to others.

C. An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of petroleum products is prohibited. The use of chlorides may be permitted with approval from the Engineer.

D. To be approved, sprinkling must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor shall have sufficient competent equipment on the job to accomplish this. Dust control shall be performed as the Work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Owner.

3.05 NOISE CONTROL

A. The Contractor shall make every effort to minimize noises caused by the construction operations. Equipment shall be equipped with silencers or mufflers

designed to operate with the least possible noise in compliance with Federal and State regulations.

3.06 MAINTENANCE OF POLLUTION-CONTROL FACILITIES DURING CONSTRUCTION

A. During the life of this Contract, the Contractor shall maintain all facilities constructed for pollution control as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created.

END OF SECTION

SECTION 01355
SPECIAL PROVISIONS

PART 1 GENERAL

1.01 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

B. Unless specified otherwise in the Contract Documents, all equipment supplied under these Specifications shall be warranted by the Contractor and the equipment manufacturers for 1 year. The warranty period shall begin on the date of Owner acceptance.

C. The equipment shall be warranted to be free from defects in workmanship, design, and materials. If any part of the equipment should fail during the warranty period, it shall be replaced in the machine(s) and the unit(s) restored to service at no expense to the Owner.

D. The manufacturer's warranty period shall run concurrently with the Contractor's warranty or guarantee period. No exception to this provision shall be allowed. The Contractor shall be responsible for obtaining equipment warranties in accordance with Section 01780, Warranties and Bonds, from each of the respective suppliers or manufacturers for all the equipment specified under the Contract Documents.

E. If the manufacturer is unwilling to provide a 1-year warranty beginning at the time of Owner acceptance, the Contractor shall obtain from the manufacturer a 2-year warranty starting at the time of equipment delivery to the job site. This 2-year warranty shall not relieve the Contractor of the 1-year warranty starting at the time of Owner acceptance of the equipment.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 INSTALLATION OF EQUIPMENT

A. The Contractor shall take special care to ensure proper alignment of all equipment with particular reference to the pumps and electric drives. The units shall be carefully aligned on their foundations by qualified millwrights after the units' sole plates have been shimmed to true alignment at the anchor bolts. The anchor bolts shall be set in place and the nuts tightened against the shims. After the Engineer has approved the foundation alignments, the bedplates or wing feet of the equipment shall be securely bolted in place. The Contractor shall further check the alignment of the equipment after it is secured to the foundations and, after all alignments are conformed, shall finally grout the sole plates in place. The Contractor shall be responsible for the exact alignment of equipment with associated piping and under no circumstances will "pipe springing" be allowed.

B. The Contractor shall furnish all wedges, shims, filling pieces, keys, packing, grout, or other materials necessary to properly align, level, and secure apparatus in place. All parts intended to be plumb or level must be proven to be exactly so. The Contractor shall perform all grinding necessary to bring parts to proper bearing after erection.

1.05 SLEEVES AND OPENINGS

A. The Contractor shall provide all openings, channels, chases, etc., in new construction and furnish and install anchor bolts and other items to be embedded in concrete, as required to complete the Work under this Contract. The Contractor shall perform all cutting, coring, and rough and finish patching required in existing construction for the work of all trades.

B. Subcontractors shall furnish all sleeves, inserts, hangers, anchor bolts, etc., required for the execution of their work. Before the work of the Contractor begins, the subcontractors shall be responsible for furnishing the Contractor with the above items and with templates, drawings, or written information covering chases, openings, etc., which they require and to follow up the work of the Contractor as it progresses, making sure that their drawings and written instructions are carried out. If the subcontractors fail to do this, they shall be responsible for the cost of any corrective measures that may be required to provide necessary openings, etc. If the Contractor fails to carry out the directions given him, covering details and locations of openings, etc., he shall be responsible for any cutting and refinishing required to make the necessary corrections. In no case shall beams, lintels, or other structural members be cut without the approval of the Engineer.

1.06 GREASE, OIL, AND FUEL

A. The Contractor shall furnish all grease, oil, and fuel required for testing equipment with the respective equipment. The Owner shall be furnished with a year's supply of required lubricants including grease and oil of the type recommended by the manufacturer with each item of equipment supplied under the Contract Documents.

1.07 TOOLS

A. The Contractor shall furnish any special tools (including grease guns or other lubricating devices) which may be necessary for the adjustment, operation, and maintenance of any equipment with the respective equipment.

B. Tools shall be furnished in heavy steel toolboxes complete with lock and duplicate keys.

1.08 PIPE MARKING

A. Pipe marking is included in Division 9 under Painting and Coating, but it shall be the Contractor's responsibility, as required by the Engineer, to help identify pipe contents, direction of flow, and all else required for proper marking of pipe.

1.09 VALVE IDENTIFICATION

A. The Contractor shall prepare a valve schedule for all valves required for the Work showing a number, the location, type, function, and normal operating position for each valve. The schedule shall be submitted to the Engineer for approval not less than 120 days before start-up. The Contractor shall coordinate valve identification with Section 15110, Manual, Check, and Process Valves.

B. The Contractor shall furnish tags for all valves required for the Work. Valve tags shall be 2-inch diameter, 19-gauge, brass or plastic, with brass hooks suitable for attaching the tag to the valve operator. Tags shall be stamped or etched with the valve number and the information on the valve schedule coded in a system provided by the Owner. The Contractor shall submit two samples of the type of tag proposed and the manufacturer's standard color chart and letter styles to the Engineer for approval.

C. The Contractor shall install valve tags on all valves required for the Work.

1.10 NOISE LIMITATIONS

A. All equipment to be furnished under this Contract, unless specified otherwise in the Technical Specifications, shall be designed to ensure that the sound pressure level does not exceed 85 decibels over a frequency range of 37.8 to 9,600 cycles per second at a distance of 3 feet from any portion of the equipment, under any load condition, when tested using standard equipment and methods. Noise levels shall include the noise from the motor. Mufflers or external baffles shall not be acceptable for reducing noise. Data on noise levels shall be included with the shop drawing submittal.

1.11 SPARE PARTS

A. Where spare parts are specified in the Specification Sections, the Contractor shall furnish all spare parts recommended by the manufacturer or system supplier for 1 year of service. In addition, the Contractor shall furnish all spare parts itemized in each Section.

B. The Contractor shall collect and store all spare parts in an area to be designated by the Engineer and shall furnish the Engineer with an inventory listing all spare parts, the equipment they are associated with, the name and address of the supplier, and the delivered cost of each item. Copies of actual invoices for each item shall be furnished with the inventory to substantiate the delivery cost.

C. Spare parts shall be packed in cartons properly labeled with indelible markings with complete descriptive information, including manufacturer, part number, part name, and equipment for which the part is to be used and shall be properly treated for 1 year of storage.

1.12 HURRICANE PREPAREDNESS PLAN

A. Within 30 calendar days of the date of Notice to Proceed, the Contractor shall submit a Hurricane Preparedness Plan to the Engineer and the Owner for approval. The Plan shall describe in detail the necessary measures that the Contractor will perform, at no additional costs to the Owner, in case of a hurricane warning. The Contractor shall revise the Plan as required by the Engineer and Owner.

1.13 WEATHER PROTECTION

A. In the event of inclement weather, the Contractor shall protect the Work and materials from damage or injury from the weather. If, in the opinion of the Engineer, any portion of the Work or materials has been damaged by reason of failure on the part of the Contractor to protect the Work, such Work and materials

shall be removed and replaced with new materials and Work to the satisfaction of the Engineer.

1.14 PROVISIONS FOR CONTROL OF EROSION

A. The Contractor shall take sufficient precautions during construction to minimize the run-off of polluting substances such as silt, clay, fuels, oils, bitumens, calcium chloride, or other polluting materials harmful to humans, fish, or other life, into the supplies and surface waters of the State. Control measures must be adequate to ensure that turbidity in the receiving water will not be increased more than 10 nephelometric turbidity units (NTU), or as otherwise required by the State or other controlling body, in water used for public water supply or fish unless limits have been established for the particular water. In surface water used for other purposes, the turbidity must not exceed 25 NTU unless otherwise permitted. Special precautions shall be taken in the use of construction equipment to prevent operations that promote erosion.

1.15 PROVISIONS FOR THE CONTROL OF DUST AND LITTER

A. The Contractor shall take sufficient precautions during construction to minimize the amount of dust created. Wetting down the Site may be required or as directed by the Engineer to prevent dust as a result of vehicular traffic. Control of blowing litter caused by any regrading by the Contractor shall be the responsibility of the Contractor.

1.16 ON-SITE STORAGE

A. The Contractor should note that there may be special storage requirements and possible charges for noncompliance of on-site storage requirements for materials and equipment as specified in Section 01600, Materials and Equipment.

1.17 ELECTRICAL POWER AND TESTING EQUIPMENT

A. The Contractor shall furnish electric power and all equipment and tools required for testing equipment. The cost of this electric power, equipment, and tools shall be included in the prices quoted in the Bid Form.

1.18 PROTECTION AGAINST ELECTROLYSIS

A. Where dissimilar metals are used in conjunction with each other, the Contractor shall provide suitable insulation between adjoining surfaces to eliminate direct contact and any resulting electrolysis. The insulating material shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers, or other approved materials.

1.19 DAMAGE DUE TO HIGH WATER

A. The Contractor will be responsible for all damage done to his work by heavy rains or floods and he shall take all reasonable precautions to provide against damages by building such temporary dikes, channels, or shoring to carry off stormwater as the nature of the work may require.

1.20 EMERGENCY PHONE NUMBERS AND ACCIDENT REPORTS

A. Emergency phone numbers (fire, medical, police) shall be posted at the Contractor's phone and the phone's location be made known to all.

B. Accidents shall be reported immediately to the Engineer by messenger or phone.

C. The Contractor shall document all accidents and shall submit to the Engineer a fully detailed written report about the accident after each accident.

1.21 ITEMS SPECIFIED ON DRAWINGS

A. Items of material, equipment, machinery, and the like may be specified on the Drawings and not in the Specifications. The Contractor shall provide such items in accordance with the Specification on the Drawings.

1.22 DISINFECTION

A. The Contractor shall clean, disinfect, and bacteriologically test and clear, in accordance with Chapters 62-550, 62-555, and 62-560 of the Florida Administrative Code (FAC), all water supply facilities affected by this project which shall come into contact with raw water, water being treated, or treated water before placing the facility in operation. This shall apply to new facilities installed as well as to existing facilities that are to be modified.

B. The Contractor shall employ a disinfection method approved by the Engineer and Owner and shall fully satisfy the Owner that adequate disinfection has been achieved before placing a facility on-line.

C. The cost of all disinfection work shall be included in the prices quoted in the Proposal. The Contractor shall pay for all bacteriological clearance tests.

1.23 SALVAGE

A. Any existing equipment or material, including but not limited to valves, pipes, fittings, couplings, etc., which is removed or replaced as a result of construction

under this project may be designated as salvage by the Engineer or Owner and, if so, shall be excavated, if necessary, and shall be cleaned and stored on or adjacent to the Site in a protected place specified by the Engineer or loaded onto trucks provided by the Owner. Any equipment or material not worthy of salvaging, as directed by the Owner, shall be disposed of by the Contractor at a suitable location at the Contractor's expense.

1.24 WORKMANSHIP, MATERIAL, AND EQUIPMENT

A. When a particular product or products are specified or called for, it is intended and shall be understood that the proposal tendered by the Contractor include those products in his bid. Should the Contractor desire to substitute a product or products equal to those specified, the Contractor shall furnish information as described in the Standard General Conditions. The alternate product or products submitted by the Contractor shall meet the requirements of the Specifications and shall, in all respects, be equal to the product or products specified by name in the Specifications.

B. All apparatus, mechanisms, equipment, machinery, and manufactured articles for incorporation into the Work shall be the new and unused standard products of recognized reputable manufacturers.

1.25 SERVICES OF MANUFACTURERS' FIELD SERVICE TECHNICIAN

A. Bid prices of equipment furnished under the Contract Documents shall include the cost of a competent field service technician of the manufacturers of all equipment to supervise the installation, adjustment, and testing of the equipment and to instruct the Owner's operating personnel on operation and maintenance. The approved manufacturer's operation and maintenance data as specified in Section 01830, Operations and Maintenance Manuals, shall be delivered to the Engineer before instructing the Owner's personnel. This supervision may be divided into two or more periods as required by the installation program or as directed by the Engineer.

B. After the equipment has been installed and the equipment is presumably ready for operation, but before it is operated by others, the manufacturers' field service technician shall inspect, operate, test, and adjust the equipment. The inspection shall include at least the following points where applicable:

1. Soundness (without cracked or otherwise damaged parts).
2. Completeness in all details, as specified and required.
3. Correctness of setting, alignment, and relative arrangement of various parts.
4. Adequacy and correctness of packing, sealing, and lubricants.

5. Calibration and adjustment of all related instrumentation and controls.
6. Energize equipment.
7. Deficiency correction.
8. Demonstration of compliance with application performance specification.

C. The operation, testing, and adjustment shall be as required to prove that the equipment has been left in proper condition for satisfactory operation under the conditions specified.

D. Upon completion of this operation, testing, and adjustment, the manufacturers' field service technician shall submit to the Engineer, in triplicate, a complete, signed report of the results of the inspection, operation, adjustments, and tests. The report shall include detailed descriptions of the points inspected, tests and adjustments made, quantitative results obtained if such are specified, and suggestions for precautions to be taken to ensure proper maintenance.

E. Each equipment manufacturer shall provide instruction to the Owner's operating personnel. Training shall not be performed until the requirements of Paragraphs B, C, and D above have been fully satisfied and any specified performance testing completed. Training shall be provided on an 8-hour-per-day basis. Partial days (less than 8 full working hours) shall not be credited toward the specified durations. Training shall not be concurrent with on-going testing, debugging, or installation activities but shall be a separate activity devoted exclusively to the instruction of the Owner's personnel in the operation and maintenance of the manufacturers' equipment. Training shall be performed by qualified representatives of each equipment manufacturer specifically skilled in providing instruction to operation personnel. Training shall provide an overview of operations and maintenance requirements and shall include but not be limited to the following:

1. Description of unit and component parts.
2. Operating capabilities and performance criteria.
3. Operating procedures.
4. Maintenance procedures.
5. Servicing and lubrication schedules.
6. Troubleshooting.
7. Electrical instrumentation and control requirements and interface as a minimum. The operating and maintenance data to be provided in accordance with Section 01830, Operations and Maintenance Manuals, shall be used as a basis for training.

F. A certificate from the manufacturer stating that the installation of the equipment is satisfactory; that the unit has been satisfactorily tested and is ready for operation; and that the operating personnel have been suitably instructed in the operation,

lubrication, and care of the unit shall be submitted before start-up and acceptance by the Owner. The certificate shall indicate date and time the instruction was given and names of the operating personnel in attendance.

G. See the detailed Specifications for additional requirements for furnishing the services of the manufacturers' field service technician.

1.26 OPERATING AND MAINTENANCE DATA

A. Operating and maintenance data covering all equipment furnished shall be delivered directly to the Engineer, for approval, within 60 days before the facility's start-up. No payment shall be made for equipment installed or stored on site until the Engineer has approved the adequacy and completeness of the operating and maintenance data. Data shall be prepared and submitted in full conformance with Section 01830, Operations and Maintenance Manuals. Final approved copies of operating and maintenance data shall have been delivered to the Engineer on the Owner's behalf 2 weeks before scheduling the instruction period with the Owner.

1.27 RESPONSIBILITY OF CONTRACTOR

A. The Contractor shall be responsible for the entire Work determined by the Drawings, Specifications, and Contract from the date of the starting of the Work until it is accepted as evidence of approval of the Completion Certificate by the Owner. The Contractor shall be responsible for removals, renewals, and replacements due to action of the elements and all other causes except as otherwise provided in the Specifications. The Contractor shall keep the Contract under his own control, and it shall be his responsibility to see that the Work is properly supervised and carried on faithfully and efficiently. The Contractor shall supervise the work personally or shall have a competent English-speaking superintendent or representative, who shall be on the site of the project at all working hours and who shall be empowered with full authority by the Contractor to direct the performance of the Work and make arrangement for all necessary materials, equipment, and labor without delay.

B. Renewals or repairs required because of defective materials or workmanship or due to the action of the elements or other natural causes, including fire and flood, before the acceptance as determined by the Completion Certificate, shall be done in accordance with the Contract and Specifications at the expense of the Contractor.

1.28 CONSTRUCTION CONDITIONS AND SUBSURFACE INVESTIGATION

A. The Contractor shall strictly adhere to the specific requirements of the governmental unit(s) or agency(ies) having jurisdiction over the Work. Wherever there is a difference in the requirements of a jurisdictional body and these Specifications, the more stringent shall apply.

B. The Contractor shall be responsible for having determined to his satisfaction, before submitting his bid, the nature and location of the Work, the conformation of the ground, the character and quality of the substrata, the types and quantity of materials to be encountered, the nature of the groundwater conditions, the character of equipment and facilities needed before and during the execution of the Work, the general and local conditions, and all other matters which can in any way affect the Work under this Contract. The prices established for the work to be done will reflect all costs pertaining to the Work. Any claims for extras based on substrata, groundwater table, and other such conditions will not be allowed.

1.29 SUSPENSION OF WORK DUE TO WEATHER

A. During inclement weather, all work which might be damaged or rendered inferior by such weather conditions shall be suspended. The orders and decisions of the Engineer as to suspensions shall be final and binding. The ability to issue such an order shall not be interpreted as a requirement to do so. During suspension of the work from any cause, the Work shall be suitably covered and protected so as to preserve it from injury by the weather or otherwise, and if the Engineer shall so direct, the rubbish and surplus materials shall be removed.

1.30 PERMITS

A. Upon notice of award, the Contractor shall immediately apply for all applicable permits not previously obtained by the Owner to do the Work from the appropriate governmental agency or agencies. No work shall begin until all applicable permits have been obtained and copies delivered to the Engineer. The Contractor shall bear all costs for obtaining all permits.

1.31 PUMPING

A. The Contractor with his own equipment shall do all pumping necessary to prevent flotation of any part of the structures during construction operations.

B. For the duration of the Contract and with his own equipment, the Contractor shall pump out water and wastewater which may seep or leak into the excavations or structures. Galleries and other operating areas shall be kept dry at all times. The

Engineer will determine the extent of pumping required in the tanks, channels, and other non-operating areas.

1.32 OWNER OCCUPANCY AND OPERATION OF COMPLETED FACILITIES

A. It is assumed that portions of the Work will be completed before the entire work is completed. Upon completion of construction in each individual facility, including testing, if the Owner, at its sole discretion, desires to accept the individual facility, the Contractor will be issued a dated certificate of completion and acceptance for each individual facility. The Owner will assume ownership and begin operation of the individual facility on that date and the 1-year guaranty period shall begin on that date. The Owner has the option of not accepting any individual completed facility, but accepting the entire work as a whole when it is completed and tested.

1.33 CLAIMS FOR PROPERTY DAMAGE

A. Upon notification by the Owner or Engineer, the Contractor shall investigate each claim for property damage and shall file, within 10 days of such notification, a statement with the Owner or Engineer setting forth all facts and details relative to the claim.

1.34 DAILY REPORTS

A. The Contractor shall submit daily reports of construction activities, including non-workdays. The report shall include the following:

1. Manpower, number of workers by craft.
2. Equipment on the project.
3. Major deliveries.
4. Activities work with reference to the CPM schedule activity numbers.
5. New problems.
6. Other pertinent information.

B. A similar report shall be submitted for/by each subcontractor.

C. The reports shall be submitted to the Engineer’s Field Office within 2 days of the respective report date. Each report shall be signed by the Contractor’s Superintendent or Project Manager.

1.35 CONNECTIONS TO EXISTING SYSTEMS

A. The Contractor shall perform all work necessary to locate, excavate, and prepare for connections to the terminus of the existing systems all as shown on the

Drawings or where directed by the Engineer. The cost of this work and for the actual connection of the existing mains shall be included in the bid for the Project and shall not result in any additional cost to the Owner.

1.36 COORDINATION OF WORK

A. Because of the nature of this Project, the Contractor should expect other construction to occur in the vicinity of this Project during the Contract. In such instances the Contractor will be required to cooperate fully to eliminate or minimize the creation of conflicts. Adjustments from time to time may be required in the Contractor's work location and/or schedule provided a reasonable notice is given by the Owner or Engineer.

B. The Contractor shall afford other contractors and the Owner reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work and shall properly connect and coordinate the Work with such other work. The Contractor shall coordinate his Work with the Owner and other contractors to store his apparatus, materials, supplies, and equipment in such orderly fashion at the site of the Work so that it will not unduly interfere with the progress of the Work or the work of any other contractors.

C. If the execution or result of any part of the Work depends on any work of the Owner or of any separate contractor, the Contractor shall, before proceeding with the Work, inspect and promptly report to the Owner in writing any apparent discrepancies or defects in such work of the Owner or of any separate contractor that render it unsuitable for the proper execution or result of any part of the Work.

D. Failure of the Contractor to inspect and report any deficiencies shall constitute an acceptance of the Owner's or separate contractor's work as fit and proper to receive the Work, except as to defects which may develop in the Owner's or separate contractor's work after completion of the Work and which the Contractor could not have discovered by his inspection before the Work was completed.

E. If the Contractor damages the work or property of the Owner or of any separate contractor on the Project or other work on the Site, or delays or interferes with the Owner's work on ongoing operations or facilities or adjacent facilities or the separate contractor's work, the Contractor shall be liable for damage caused, and, in the case of another contractor, the Contractor shall attempt to settle the claim with the other contractor before the other contractor institutes litigation or other proceedings against the Contractor.

F. If a separate contractor sues the Owner on account of any damage, delay, or interference caused or alleged to have been caused by the Contractor, the Owner shall notify the Contractor, who shall defend the Owner in such proceedings at the

Contractor's expense. If any judgment or award is entered against the Owner, the Contractor shall satisfy the same and shall reimburse the Owner for all damages, expenses, attorneys' fees, and other costs which the Owner incurs as a result of the judgment or award.

G. If a separate contractor causes damage to the Work or to the property of the Contractor or causes delay or interference with the Contractor's performance of the Work, the Contractor shall present directly to the separate contractor any claims it may have as a result of such damage, delay, or interference (with an information copy to the Owner) and shall attempt to settle its claim against the separate contractor before instituting litigation or other proceedings against the separate contractor.

H. In no event shall the Contractor seek to recover from the Owner or the Engineer, and the Contractor hereby represents to the Owner and the Engineer that he will not seek to recover from them, or either of them, any costs, expenses, (including, but not limited to, attorneys' fees) or losses of profit incurred by the Contractor as a result of any damage to the Work or property of the Contractor or any delay or interference caused or allegedly caused by any separate contractor.

I. The Engineer shall determine and adjust any difference or conflict which may arise between the Contractor and other contractors who may be performing work on behalf of the Owner or between the Contractor and workmen of the Owner in regard to their work. If the work of the Contractor is delayed because of any acts of omissions of any other contractor of the Owner, the Contractor shall on that account have no claim against the Owner other than for an extension of time.

1.37 FINAL GUARANTEE

A. The Contractor shall guarantee all work for 1 year from the date of Substantial Completion of the Work by the Owner.

B. If, within the guarantee period, repairs or changes are required in connection with guaranteed work, which, in the opinion of the Engineer, are rendered necessary as the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, the Contractor shall do the following promptly upon receipt of notice from the Owner and without expense to the Owner:

1. Place in satisfactory condition in every way all such guaranteed work and correct all defects in the guaranteed work.
2. Make good all damage to the building or site, or equipment or piping, or their contents, which, in the opinion of the Engineer, is the result of the

use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the contract.

3. Make good any work or material or the equipment and contents of the building, structure, or site disturbed in fulfilling any such guarantee.

C. If the Contractor, after notice, fails to proceed to comply with the terms of this guarantee within 10 days, the Owner may have the defects corrected and the Contractor and his surety shall be liable for all expenses incurred provided. However, that in case of an emergency where, in the opinion of the Owner, delay would cause loss or damage, repairs may be started without notice being given to the Contractor and the Contractor shall pay the cost of such repairs.

D. All special guarantees or warranties applicable to specific parts of the Work as may be stipulated in the Contract Specifications or other papers forming a part of this Contract shall be subject to the terms of this Paragraph during the first year of life of each such guarantee. The Contractor shall assemble all special guarantees and manufacturers' warranties, along with a summary list of the special guarantees and warranties, and deliver these to the Engineer before the Work is accepted.

1.38 AUTOMATICALLY CONTROLLED EQUIPMENT

A. Whenever batching or mixing plant equipment is required to be operated automatically under the Contract and a breakdown or malfunction of the automatic controls occurs, the equipment may be operated manually or by other methods for 48 hours after the breakdown or malfunction, provided this method of operation will produce results otherwise meeting the Specifications.

1.39 EQUIPMENT DATA FORMS

A. The Contractor shall obtain, prepare, and submit a complete, detailed listing of equipment and motor data for all electrical items furnished under this Contract. This listing shall be submitted with the preliminary draft of Operations and Maintenance Data Manuals on Equipment Data sheets and the Equipment Manufacturer’s Certificate of Installation, Testing, and Instruction and the Manufacturer’s Certificate of Compliance forms.

1.40 RIGHTS IN AND USE OF MATERIALS FOUND ON THE WORK

A. With the approval of the Engineer, the Contractor may use on the project such stone, gravel, sand, or other material determined suitable by the Engineer as may be found in the excavation and will be paid both for the excavation of such materials at the corresponding Contract unit price and for the pay item for which the excavated material is used. The Contractor shall replace at his own expense,

with other acceptable material, all of that portion of the excavation materials so removed and used which were needed for use in the embankments, backfills, approaches, or otherwise. No charge for the materials used will be made against the Contractor.

1.41 OWNER-FURNISHED MATERIAL

A. The Contractor shall furnish all materials required to complete the Work. No materials will be furnished by the Owner.

1.42 MAINTENANCE AND LUBRICATION SCHEDULES

A. The Contractor's attention is directed to Section 01830, Operations and Maintenance Manuals, for requirements relative to the submission of operating and maintenance data for the mechanical equipment. For all mechanical and electrical equipment furnished, the Contractor shall provide a list including the equipment name, address, and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.

1.43 INSTALLATION LISTS

A. All manufacturers or equipment suppliers who propose to furnish equipment or products under the Contract Documents shall submit an installation list to the Engineer along with the required Shop Drawings.

B. The installation list shall include all installation where identical equipment has been installed and has been in operation for at least 1 year.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01400
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. General

1. This Section defines minimum requirements for the Quality Assurance (QA) Program to be provided by the Contractor. The deliverable documents are defined, along with the method of execution of the QA Program.
2. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with the Contract Document requirements.
3. Specified tests, inspections, and related actions do not limit the Contractor's Quality Control (QC) procedures that facilitate compliance with the Contract Documents.

B. Definitions

1. Quality Assurance services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with Contract requirements.
2. Quality Control services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction comply with requirements.

C. Payment

1. Separate payment will not be made for providing and maintaining an effective Quality Assurance and Quality Control Program, and all costs associated with such a program shall be included in the applicable unit prices, lump-sum prices, or allowances contained in the Contract Price Breakdown.

1.02 WORK SEQUENCE

A. Where reference is made to a particular standard, the revision in effect at the time of Bid opening shall apply except where a specific date is established.

B. For products or workmanship specified by association, trades, or other consensus standards, the Contractor shall comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable code.

C. If specified reference standards conflict with Contract Documents, the Contractor shall request clarification from the Engineer before proceeding.

1.03 QUALITY ASSURANCE

A. The Contractor shall install all materials and equipment in a neat and first-class workman-like manner.

B. The Contractor shall replace all existing paving, stabilized earth, curbs, driveways, sidewalks, fences, signs, and other improvements with the same type of material that was removed during construction or as directed by the Engineer without increase in the Contract Price or Contract Time.

C. The Engineer reserves the right to direct the removal and replacement of any items which, in the Engineer's opinion, do not present an orderly and reasonably neat or workman-like appearance, provided such an orderly installation can be made using customary trade methods. The removal and replacement shall be done when directed in writing by the Engineer at the Contractor's own expense and without additional expense to the Owner.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 TOLERANCES

A. Monitor tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. If manufacturers' tolerances conflict with Contract Documents, request clarification from the Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.07 FIELD SAMPLES

A. The Contractor shall furnish field samples at the site as required by individual Specifications Sections for review.

B. Acceptable samples represent a quality level for the Work.

C. Where field sample is specified in individual Sections to be removed, the Contractor shall clear the area after the field sample had been accepted by the Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor is responsible for quality control and shall establish and maintain an effective QC system in compliance with the Contract Documents. The QC system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the Contract requirements. The system shall cover all Work and shall be keyed to the proposed design and construction sequence. The project QC Officer will be held responsible for the quality of work on the job and is subject to removal by the Engineer for non-compliance with quality requirements specified in the Contract. The project QC Officer in this context shall mean the individual with the responsibility for the overall management of the project quality.

3.02 QUALITY CONTROL PLAN

A. General: Not later than 30 calendar days after receipt of Notice to Proceed, the Contractor shall furnish for review by the Engineer the QC Plan proposed to implement the requirements of the Contract. The Plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. The Engineer will consider an interim plan for the first 30 calendar days of operation.

B. Content of the QC Plan: The QC Plan shall include, at a minimum, the following to cover all construction operations, both on-site and off-site, including work by subcontractors, fabricators, suppliers, and purchasing agents:

1. A description of the quality control organization, including a chart showing lines of authority for all aspects of the Work specified. The staff shall include a Quality Control Officer who shall report to the Project Manager or executive.
2. The name, qualifications (in résumé format), duties, responsibilities, and authorities of each person assigned a QC function.
3. A copy of the letter to the Quality Control Officer signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the Quality Control Officer, including authority to stop work which is not in compliance with the Contract.
4. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, off-site fabricators, suppliers, and purchasing agents.
5. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will verify that identified deficiencies have been corrected.
6. Reporting procedures, including proposed reporting formats.

C. Acceptance of Plan

1. Acceptance of the Contractor's plan is required before the start of Work. Acceptance is conditional and will be predicated on satisfactory performance during the Work. The Engineer reserves the right to require the Contractor to make changes in its QC Plan and operations, including removing personnel as necessary to obtain the quality specified.

D. Notification of Changes

1. After acceptance of the QC Plan, the Contractor shall notify the Engineer in writing of any proposed change. Proposed changes are subject to acceptance by the Engineer.

3.03 SUBMITTALS

A. Submittals shall be made as specified in Section 01330, Submittals and Acceptance. The QC organization shall be responsible for certifying that all submittals are in compliance with the Contract requirements.

3.04 TESTS

A. Testing Services

1. All tests to determine compliance with the Contract Documents shall be performed by an independent commercial testing firm acceptable to the Owner. The testing firm's laboratory shall be staffed with experienced technicians, properly equipped, and fully qualified to perform the tests in accordance with the specified standards.
2. Testing services provided by the Owner are for the sole benefit of the Owner; however, test results shall be available to the Contractor. Testing necessary to satisfy the Contractor's internal Quality Control Procedures shall be the sole responsibility of the Contractor.
3. When necessary, the Contractor shall interrupt its Work for Owner sampling and testing. The Contractor shall have no Claim for increase in Contract Price or Contract Time due to such interruption. The Contractor shall cooperate in these testing activities as needed.
4. Testing, including sampling, will be performed by the testing firm's laboratory personnel in the general manner indicated in the Specifications.

B. Transmittal of Test Reports

1. Written reports of tests and engineering data furnished by the Contractor for the Engineer's review shall be submitted as specified for Shop Drawings.

C. Manufacturer's Field Services (As Applicable)

1. The manufacturer's field services will be specified in the respective Equipment Sections.
2. An experienced, competent, and authorized representative of the manufacturer of each item of equipment for which field services are indicated shall visit the Site of the Work and inspect, check, adjust if necessary, and approve the equipment installation. In each case the manufacturer's representative shall be present when the equipment is placed in operation. The manufacturer's representative shall revisit the Site as often as necessary until any and all trouble is corrected and the equipment installation and operation are satisfactory in the opinion of the Engineer.
3. Each manufacturer's representative shall furnish to the Owner, through the Engineer, a written report certifying that the equipment has been properly installed and lubricated, is in accurate alignment, is free from any undue stress imposed by connecting piping or anchor bolts, has been operated under full load conditions, and has operated satisfactorily.

3.05 COMPLETION INSPECTION

A. Final Completion Punch List: Near the completion of all Work the QC Officer shall inspect the Work and develop a "punch list" of items which do not conform to the approved Drawings and Specifications. Such a list of deficiencies shall be included in the QC documentation and shall include the estimated date by which the deficiencies will be corrected. The QC Officer or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Engineer that the Facility is ready for the Engineer's final inspection.

B. Final Inspection and Acceptance: The Contractor's Quality Control Officer and the Engineer will be in attendance at this inspection. Additional Engineer personnel may also be in attendance. The final acceptance inspection will be formally scheduled by the Engineer when all punch list deficiencies have been corrected. Notice will be given to the Engineer at least 14 days before the final inspection and must include the Contractor's assurance that all punch list items will be complete and acceptable by the date scheduled for the final inspection. Failure of the Contractor to have all Contract Work acceptably complete for this inspection will be cause for noncertification of final payment by the Engineer.

3.06 NOTIFICATION OF NONCOMPLIANCE

A. The Engineer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Engineer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.07 REPAIR AND PROTECTION

A. On completion of testing, inspection, sampling, and similar services, the Contractor shall repair damaged construction and restore substrates and finishes.

B. The Contractor shall protect all construction exposed by or for Quality Control service activities.

C. The repair and protection are the Contractor's responsibilities, regardless of the assignment of responsibility for Quality Control services.

END OF SECTION

SECTION 01450
TESTING AND TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Owner will pay for the costs of all passing laboratory tests required to determine soil density, concrete compressive strength, and bacteriological clearance of water main. The cost of all testing shall be paid for from the Bid Item allowance as stated in the Bid Form. Costs will be determined from direct invoices from the testing laboratory to the Contractor. Failed tests will be back-charged to the Contractor at the time of final payment. All required soil, concrete, and bacteriological water testing shall be coordinated with and scheduled by the Contractor.

1. The Contractor shall cooperate with the laboratory to facilitate the execution of required services.
2. The Owner shall approve the selection of the testing laboratory.
3. Employment of a testing laboratory shall in no way relieve the Contractor of the obligation to perform work in accordance with the requirements of the Contract Documents.

1.02 RELATED WORK

A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders, or approvals of public authorities.

B. Respective Sections: Certification of products.

C. Each Section listed: Laboratory tests required and standards for testing.

D. Testing Laboratory inspection, sampling, and testing are required for but are not limited to the following:

1. Section 02230, Site Preparation.
2. Section 02305, Earthwork for Utilities.
3. Section 02700, Earthwork, Paving, and Markings.
4. Section 03301, Concrete and Reinforcing Steel.
5. Section 15055, Piping Systems—General.
6. Section 15141, Disinfection of Piping and Water Storage Facilities.

1.03 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. Submit to the Engineer for review a list and schedule of all tests to be conducted.

C. Describe test procedures along with duration of tests.

D. After each inspection and test, the Laboratory shall promptly submit two copies of the laboratory report to the Engineer, one copy to the Contractor, and one copy to the Owner.

E. Include the following:

1. Date issued.
2. Project title and number.
3. Name of field testing technician or inspector.
4. Date and time of sampling or inspection.
5. Identification of product and Specifications Section.
6. Location in the Project.
7. Type of inspection or test.
8. Date of test.
9. Results of test.
10. Conformance with Contract Documents.

F. When requested by the Engineer, provide interpretation of test results.

1.04 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM E329—Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
2. ASTM D3740—Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

1.05 QUALITY ASSURANCE

A. The Laboratory is not authorized to do any of the following:

1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of the work.
3. Perform any duties of the Engineer of Record or the Engineer.

B. The Contractor shall be responsible for the following:

1. Cooperating with laboratory personnel, providing access to work and to manufacturer's operations.

2. Securing and delivering to the laboratory adequate quantities of representative samples of materials proposed to be used and which require testing.

3. Providing to the laboratory the preliminary design mix proposed to be used for concrete and other materials mixes which require control by the testing laboratory.

4. Furnishing incidental labor and facilities:

   a. To provide access to work to be tested.
   b. To obtain and handle samples at the project site or at the source of the product to be tested.
   c. To facilitate inspections and tests.
   d. To store and cure test samples.

5. Notifying the Engineer and laboratory sufficiently in advance of operations to allow for the laboratory to assign personnel and schedule tests.

6. Employing and paying for the services of the same or a separate, equally qualified independent testing laboratory to perform additional inspections, sampling, and testing required for the Equipment Supplier or Contractor's (as applicable) convenience.

C. Materials and equipment used in the performance of Work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. Standard requirements for quality and workmanship are indicated in the Contract Documents. The Engineer may require the equipment supplier or Contractor (as applicable) to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured

or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the Contract Documents. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor, and no extra charge to the Owner shall be allowed on account of such testing and certification.

D. If the test and any subsequent retest results indicate that the materials or equipment fail to meet the requirements of the Contract Documents, the equipment supplier or Contractor (as applicable) shall pay for the laboratory costs directly to the testing firm and these will not be reimbursable to the equipment supplier or Contractor (as applicable).

1.06 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.07 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.08 QUALIFICATIONS

A. Comply with requirements of ASTM E329 and ASTM D3740.

B. Laboratory: Licensed to operate in Florida.

C. Laboratory Staff: Maintain a full-time Professional Engineer registered in Florida on staff to review the services performed under this project.

D. Testing Equipment: Calibrated at reasonable intervals with devices of accuracy traceable to either National Bureau of Standards (NBS) or accepted values of natural physical constants.

E. Provide qualified personnel at the site. Cooperate with the Engineer and Contractor in performing services.

F. Perform specified inspection, sampling, and testing of products in accordance with specified standards.

G. Ascertain compliance of materials and mixes with requirements of Contract Documents.

H. Promptly notify the Engineer and Contractor of observed irregularities or non-conformance of Work or Products.

I. Perform additional inspections and tests required by Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01500
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.02 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.03 RESPONSIBILITY

A. This Section specifies the minimum requirements for temporary facilities, utilities, and controls required to provide an adequate and safe work site at every stage during construction of the Project. The Contractor is solely responsible for the requirements set forth in this Section.

1.04 ONSITE TEMPORARY

A. Except as otherwise indicated, the Contractor may, at his option, furnish stand-alone utility plants to provide needed services in lieu of connected services from available public utilities, provided such stand-alone plant facilities comply with all governing regulations. Before availability of temporary utility services, the Contractor will provide trucked-in/trucked-out containerized or unitized services for start-up of construction operations at the site.

1.05 COSTS

A. Except as otherwise indicated, the costs of providing and using temporary utility services are included in the Contract Sum.

1.06 TEMPORARY FACILITIES

A. The types of utility services required for temporary use at the project site include the following (other specific services may be required for specific construction methods of operations):

1. Electrical Power Service.
2. Water Service (potable for certain uses).
3. Sanitary.
4. Storm Sewer or Open Drainage/Run-off Control.
5. Gas (fuel) Service.
6. Telephone Service.

1.07 TEMPORARY ELECTRICITY

A. The Contractor shall make the necessary applications and arrangements and pay all fees and charges for electrical energy for power and light necessary for proper completion of the Work and during its entire progress up to time of final acceptance by the Owner. The Contractor shall provide and pay for all temporary switches, connections, and meters.

1.08 TEMPORARY WATER

A. The Contractor shall make all necessary application and arrangements and pay all fees and charges for water necessary for the proper completion of the Project up to the time of final acceptance. The Contractor shall provide and pay for any temporary piping and connections.

1.09 TEMPORARY SANITARY FACILITIES

A. The Contractor shall provide adequate sanitary facilities for the use of those employed on the Work. Such facilities shall be made available when the first employees arrive on the site of the Work, shall be properly secluded from public observation, and shall be constructed and maintained during the progress of the Work in suitable numbers and at such points and in such manner as may be required or approved.

1.10 CLEANLINESS OF FACILITIES

A. The Contractor shall maintain the sanitary facilities in a satisfactory and sanitary condition at all times and shall enforce their use. He shall rigorously prohibit the committing of nuisances on the site of the Work, on the lands of the Owner, or on adjacent property.

1.11 TERMINATION AND REMOVAL

A. At the time the need for a temporary utility service has ended or has been replaced by use of permanent services, or not later than the time of final completion, the Contractor shall promptly remove the installation unless requested by the Engineer to retain it for a longer period. Any work which may have been delayed or affected by the installation and use of the temporary utility, including repairs to construction and grades and restoration and cleaning of exposed surfaces, shall be completed at this time. The Contractor shall replace any work damaged beyond acceptable restoration.

1.12 NOISE CONTROL

A. The Contractor shall provide adequate protection against objectionable noise levels caused by the operation of construction equipment.

1.13 DUST CONTROL

A. The Contractor shall provide for adequate protection against raising objectionable dust clouds caused by moving construction equipment, high winds, or any other cause.

1.14 WATER CONTROL

A. The Contractor shall provide for satisfactory disposal of surplus water and shall submit a plan to the Engineer for review before initiating and implementing the plan. Prior approval shall be obtained from the proper authorities for the use of public or private lands or facilities for such disposal.

1.15 POLLUTION CONTROL

A. The Contractor shall provide for adequate protection against polluting any public or private lands, lakes, ponds, rivers, streams, creeks, and other such areas by the disposal of surplus material in the form of solids, liquids, gases, or from any other cause.

1.16 ADVERSE IMPACT

A. The Contractor shall evaluate and assess the impact of any adverse effects on the natural environment which may result from construction operations and shall operate to minimize pollution of air, ground, or surface waters vegetation, and afford the neighboring community the maximum protection during and up to completion of the construction project.

1.17 STREAMS, LAKES, AND OTHER BODIES OF WATER

A. The Contractor shall take sufficient precautions to prevent pollution of streams, lakes, and reservoirs with fuels, oils, bitumens, calcium chloride, or other harmful materials. He shall conduct and schedule his operations so as to avoid or otherwise prevent pollution of siltation of streams, lakes, and reservoirs and to avoid interference with the movements of migratory fish.

1.18 CHEMICALS

A. All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, must show approval of either US EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions.

1.19 EROSION CONTROL

A. The Contractor shall not expose by construction operations a larger area of erosive land at any one time than the minimum necessary for efficient construction operations, and the duration of exposure of the uncompleted construction to the elements shall be as short as practicable. Erosion-control features shall be constructed concurrently with other work and at the earliest practicable time.

1.20 STORAGE FACILITIES

A. All products, materials, and equipment shall be stored in accordance with the manufacturer's instructions, with seals and labels intact and legible. Products subject to damage by the elements shall be stored in weathertight enclosures. Temperature and humidity shall be maintained within the ranges required by the manufacturer's instructions. Fabricated products shall be stored above the ground on blocking or skids. Products which are subject to deterioration shall be covered with impervious coatings with adequate ventilation to avoid condensation. Loose granular materials shall be stored in a well-drained area on solid surfaces to prevent mixing with foreign matter. Any products which will come in contact with water shall be stored off the ground to prevent contamination.

1.21 INSPECTION

A. Storage shall be arranged in such a manner to provide easy access for inspection. Periodic inspections shall be made of all stored products to ensure that they are maintained under specified conditions and free from damage or deterioration.

1.22 TEMPORARY PROTECTION

A. After installation, the Contractor shall provide substantial coverings as necessary to installed products to protect them from damage from traffic and subsequent construction operations. Coverings shall be removed when no longer needed.

1.23 ADJACENT TO WORK

A. The Contractor shall protect from damage all property along the line of the Work or in the vicinity of or in any way affected by the Work, the removal or destruction of which is not called for by the Drawings. Wherever such property is damaged due to the activities of the Contractor, it shall be immediately restored to its original condition by the Contractor at no cost to the Owner.

1.24 REMEDY BY OWNER

A. In case of failure on the part of the Contractor to restore such property or make good such damage or injury, the Owner may, after 48 hours' notice to the Contractor, proceed to repair, rebuild, or otherwise restore such property as may be deemed necessary and the cost of such repairs, rebuilding, or restoration will be deducted from any monies due or which may become due to the Contractor under this Contract.

1.25 PROTECTION FROM DAMAGE

A. The Contractor shall be responsible for protecting property in the areas in the vicinity of the Project and for protecting his equipment, supplies, materials, and work against any damage resulting from the elements, such as flooding, rainstorm, wind damage, or other such damage, and shall be responsible for damage resulting from the same. The Contractor shall provide adequate drainage facilities, tie-downs, or other protection throughout the contract period for the protection of his, the Owner's, and other properties from such damage.

1.26 TRAFFIC REGULATION

A. Signs, marking barricades, and procedures shall conform to the requirements of the Florida Department of Transportation Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System, Index 600 Series, Traffic Control Through Work Zones.

1.27 SIGNAGE

A. The Contractor shall provide and maintain adequate barricades around open excavations.

1.28 REMOVAL OF SIGNAGE

A. On completion of the Work, the Contractor shall remove all debris, excess materials, barricades, and temporary work, leaving walkways and roads clear of obstructions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01600
MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

This Section includes the minimum requirements for the furnished materials and equipment for this project. The more stringent requirements in the Technical Specification sections shall take precedence over these requirements for any conflicts.

A. Materials and equipment furnished by the Contractor shall be new and shall not have been in service at any other installation unless otherwise approved. They shall conform to applicable specifications approved in writing by the Engineer.

B. Manufactured and fabricated products shall be designed, fabricated, and assembled in accordance with the best engineering and shop practices. Like parts of duplicate units shall be manufactured to standard sizes and gauges so as to be interchangeable.

C. Quantities of items that are identical shall be by the same manufacturer, regardless of the Design Package breakdown.

D. Equipment sizes, capacities, and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.

E. Materials and equipment shall not be used for any purpose other than that for which they are designed or specified.

F. Where materials or equipment are specifically shown or specified to be reused in the Work, special care shall be used in removing, handling, storing, and reinstalling to ensure their proper function in the completed Work.

G. Material and Equipment Incorporated Into the Work

1. Shall conform to applicable specifications and standards.

2. Shall comply with size, make, type, and quality specified or as specifically approved in writing by the Engineer.

3. Manufactured and fabricated products:

a. Rotating machinery shall be designed and fabricated to provide satisfactory operation without excessive wear and without excessive maintenance during its operating life. Rotating parts shall be statically and dynamically balanced and shall operate without excessive vibration.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 ACCEPTANCE OF MATERIAL AND EQUIPMENT

A. Only new materials and equipment shall be incorporated in the Work. All materials and equipment furnished by the Contractor shall be subject to the inspection and acceptance of the Engineer. No material shall be delivered to the site that does not meet the Contract Specifications.

B. The Contractor shall submit data and samples sufficiently early to permit consideration and acceptance before materials are necessary for incorporating in the work. Any delay of acceptance resulting from the Contractor's failure to submit samples or data promptly shall not be used as a basis of claim against the Owner.

C. The materials and equipment used in the Work shall correspond to the approved samples or other data.

D. If requested, the Contractor shall be required to submit to the Engineer ample evidence that each and every part of the materials, machinery, and equipment to be furnished is of a reliable make and of a type that has been in successful operation within the continental United States. No equipment will be considered unless the manufacturer has designed and manufactured equipment of a comparable type and size for at least 3 years. The Engineer or Owner will not allow any experimental or untried type of material or machinery to be installed.

E. The equipment specified shall be carefully designed and installed to ensure that it adequately performs all required functions within the specified degree of precision. Each unit shall operate with each of the other parts of the equipment to provide a completely integrated system that shall operate to the satisfaction of the Engineer and Owner.

F. All equipment, machinery, parts, and assemblies of equipment, machinery, or parts entering into the Work shall be tested as specified. Unless waived in writing by the Engineer, all field and operating tests shall be made in the presence of the Engineer or the Engineer's authorized representative. When such a waiver is issued, the Contractor or manufacturer shall furnish sworn statements in duplicate of the tests conducted and the results of the tests to the Engineer.

G. The Contractor shall submit copies of welding procedures for all welding. Welders and welding operators shall be selected in accordance with the qualification requirements of the AWS Code. Welders and welding operators for stainless steel shall pass qualification tests using stainless steel filler metal and procedures developed for stainless steel. Procedures, welder, and operator qualifications shall be certified by an independent testing laboratory retained and paid by the Contractor.

H. The Contractor shall not start fabrication of the Work until the Contractor receives written acceptance of the proof of welding procedures from the Engineer for each type of weld.

I. The Contractor shall submit copies of mill certificate for each type of rolled steel and as required in the Specifications. The Contractor shall not start fabrication of the work until the Contractor receives written acceptance of all mill certificates from the Engineer.

1.05 MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION

A. The equipment installation details shall suit the existing and furnished equipment and are subject to acceptance by the Engineer.

B. Any changes or revisions made necessary by the type and dimensions of the equipment furnished shall be made at the expense of the Contractor who shall furnish detailed drawings showing such changes or revision for the acceptance of the Engineer.

C. The installation of all work shall comply with the manufacturer's printed instructions. The Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including six copies to the Engineer for

distribution. One complete set of instructions shall be maintained at the job site during installation and until the Project is complete.

D. All products and equipment shall be handled, installed, connected, cleaned, conditioned, and adjusted in accordance with the manufacturer's instructions and specified requirements. Should job conditions or specified requirements conflict with the manufacturer's instructions, such conflicts shall be called to the Engineer's attention for resolution and revised instructions.

E. The Contractor shall perform work according to the manufacturer's instructions and not omit any preparatory step or installation procedure unless the instructions are specifically modified or the step or procedure exempted by the Contract Documents.

1.06 INSTALLATION OF EQUIPMENT

A. The cost of the Work shall include the cost of competent manufacturers' representatives of all equipment to supervise the installation, adjustment, and testing of the equipment and to instruct the Owner's operating personnel on operation and maintenance.

B. A certificate from the manufacturer stating that the installation of the equipment is satisfactory, that the unit has been satisfactorily tested, is ready for operation, and that the operating personnel have been suitably instructed in the operation, lubrication, and care of the unit shall be submitted before Substantial Completion.

C. The Contractor shall furnish the service of competent manufacturers' representatives for Contractor- or Owner-furnished equipment when evident malfunction or over-heating makes such services necessary or as determined by the Engineer. All such equipment shall be installed by skilled mechanics and in accordance with the instructions of the manufacturer.

D. Special care shall be taken to ensure proper alignment of all equipment with particular reference to mechanical equipment such as pumps and electric drives. These units shall be carefully aligned on their foundations by qualified millwrights after their sole or base plates have been shimmed to true alignment at the anchor bolts. The anchor bolts shall be set in place and the nuts tightened against the shims. After the manufacturer has approved the foundation alignments, the bedplates or wing feet of the equipment shall be securely bolted in place. The alignment of equipment shall be further checked after securing to the foundations. After all alignments are confirmed, the sole or base plates shall be finally grouted in place. The Contractor shall be responsible for the exact alignment of equipment with associated piping, and under no circumstances, will

"pipe springing" be allowed. Special installation requirements in the Technical Specifications shall take precedence over the requirements of this Section.

E. The Contractor shall furnish all wedges, shims, filling pieces, keys, packing, grout, or other materials necessary to properly align, level, and secure an apparatus in place. All parts intended to be plumb or level must be proven exactly so. Any grinding necessary to bring parts to proper alignment after erection shall be done at the expense of the Contractor.

F. The Contractor shall furnish the necessary materials and construct suitable concrete foundations or pads for all equipment installed by the Contractor, even though such foundations or pads may not be indicated on the Drawings. The tops of foundations shall be at such elevations as will permit grouting.

G. In setting pumps, motors, and other items of equipment customarily grouted, the Contractor shall make an allowance of at least 1 inch (2.54 cm) for grout under the equipment bases. Shims used to level and adjust the bases shall be steel. Shims may be left embedded in the grout, in which case they shall be installed neatly and so as to be as inconspicuous as possible in the completed work. Unless otherwise permitted, all grout shall be a suitable non-shrinking grout.

1. Grout shall be mixed and placed in accordance with the recommendations of the manufacturer. Where practicable, the grout shall be placed through the grout holes in the base and worked outward and under the edges of the base and across the rough top of the concrete foundation to a peripheral form so constructed as to provide a suitable chamber around the top edge of the finished foundation.
2. Where such procedure is impracticable, the method of placing grout shall be as permitted. After the grout has hardened sufficiently, all forms, hoppers, and excess grout shall be removed, and all exposed grout surfaces shall be patched in an approved manner and, if necessary, as required by the Engineer, given burlap-rubbed finish, and painted with at least two coats of an acceptable paint.

1.07 SPECIAL TOOLS

A. Manufacturers of equipment and machinery shall furnish two sets of any special tools (including grease guns or other lubricating devices) required for normal adjustment, operations and maintenance, and disassembly, together with instructions for their use. The Contractor shall preserve and deliver to the Owner these tools and instructions in good order before completing the Contract. Tools shall be high-grade, smooth, forged, alloy tool steel. Grease guns shall be lever-type.

B. Special tools are considered to be those tools which because of their limited use are not normally available, but which are necessary for the particular equipment.

C. Special tools shall be delivered at the same time as the equipment to which they pertain. The Contractor shall properly store and safeguard such special tools until completion of the work, at which time they shall be delivered to the Owner.

1.08 LUBRICATION SYSTEM

A. The minimum design criteria for lubricating moving parts of the equipment shall include 1 week of continuous operation during which no lubricants shall be added to the system.

B. The system shall be designed to receive lubricants whether in operation or shut down and shall not leak or waste lubricants under either condition. The manufacturer's recommendations of grade and quality and a supply of the lubricants so recommended in quantities sufficient to conduct start-up and testing operations shall be furnished with the equipment.

1.09 TESTS AND TEST REPORTS

A. When used in the Contract Documents, "Factory/Fabricating Shop Performance, Evaluation, Certification, and/or Acceptance Tests and Test Reports" shall be considered to mean the corresponding manufacturer’s, fabricator's, and/or other builder's official test and tests reports. Included in these test reports shall be appropriate substantiating documentation/data ascertaining the correct and complete manufacture, fabrication, and "shop performance" (to the greatest extent normally practicable) of the particular material, equipment, system, and/or facilities proposed for eventual delivery. These are subdivided into three significant tests and test report types: 1) Certification Tests and Test Reports, 2) Factory Tests and Test Reports, and 3) Shop Performance/Evaluation Tests and Test Reports. Minimal requirements are described below.

B. Certification Tests and Test Reports

1. Standard specifications, code references, etc. for minimum quality and workmanship levels are indicated in the Contract Documents and Construction Documents. Statements, certificates, and other substantiating reporting data, called "Certification Test Reports" in this Section, of tests conducted on previously manufactured materials or equipment identical to that proposed for use shall be compiled by the Contractor.
2. At a minimum all Certification Test Reports shall contain an official analysis of sufficient material composition or show evidence of meeting or exceeding the specified material standard(s) referenced, e.g., ASTM,

ASME, or other designations. All reports shall also indicate from whom the material was/will be purchased.

3. The Contractor shall pay all costs of certification tests and test reports.

C. Factory Tests and Test Reports

1. Additional tests and reports performed on material or equipment by the manufacturer or fabricator to ascertain quality or workmanship are referred to here as "Factory Tests and Test Reports."
2. Before the delivery of any Factory Test Report, the Contractor shall first submit for review and approval a detailed description of the proposed testing, including reporting procedure and criteria. Such descriptions shall also be delivered to the Engineer for review as part of the first submission of the technical submittal.
3. Materials and equipment used in the performance of the Work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. If Work to be accomplished away from the construction site is to be inspected on behalf of the Owner during its fabrication or manufacture, the Contractor shall give prior notice to the Engineer of the place and time where such fabrication or manufacture is to be done. Such notice shall be in writing and delivered to the Engineer not less than 30 days before the Work is to be done so that the necessary arrangements for the particular factory inspection tests can be made.
4. Upon completion of the factory inspection tests and immediately following manufacture or fabrication, the Contractor shall compile a complete Factory Test Report following the approved format above. All such reports shall be delivered to the Engineer for review as part of the technical submittal corresponding to such tested material or equipment.

D. Shop Performance/Evaluation Tests and Test Reports

1. Material and equipment used in the performance of the Work of this Contract are also subject to evaluation and testing after the complete full-scale assembly into major equipment and/or systems. Shop Performance/ Evaluation Tests, i.e., tests of simulated startup, steady-state, variable loading, and other normal operating conditions, for such assembled equipment/systems shall be accomplished in strict accordance with the standard testing practices specified or otherwise accepted by the Engineer.
2. Before the delivery of any Shop Performance/Evaluation Test Report, the Contractor shall submit for review a detailed description of the proposed performance/evaluation tests, including anticipated reporting procedures, data reduction, and criteria used. Where appropriate, such descriptions shall also be delivered to the Engineer for review as part of a first or subsequent submission of the technical submittal.

3. Should such performance/evaluation tests be accomplished away from the construction site, the Contractor shall give prior notice to the Engineer of the places and times where such tests will be accomplished. Such prior notice shall be in writing and delivered not less than 30 days before such events so that necessary arrangements for the particular tests can be made.
4. The requirements above pertaining to Factory Tests and Test Reports shall be incorporated for shop Performance/Evaluation Tests and Test Reports. Unless factory tests are coincident with shop performance tests and vice versa for the same material or equipment, a minimum of 15 days shall be scheduled between such multiple equipment tests where extended travel is required.

E. Cost of Performance Shop Tests

1. The Contractor shall conduct shop performance full-scale tests at its expense on all equipment as specified. Each piece of equipment shall be tested completely assembled and the shop tests performed by the equipment manufacturer until successful tests are achieved.
2. If the performance tests are conducted outside the continental United States, the Contractor shall pay all transportation expenses incurred by the Owner’s representatives in witnessing the tests at no additional cost to the Owner.

1.10 FIELD TESTING

A. Field-testing shall be conducted when called for in the Technical Specification Sections and on all completed systems in general. The Contractor shall provide services of a factory-authorized service representative to perform, approve, and certify the field testing specified in this Section. Field testing shall generally consist of performing the pre-startup and startup tests and the final mechanical performance test as specified in the Contract Documents. The Contract Documents may require the Contractor to perform factory testing on equipment items before the Engineer approves their use for this project. The Contractor shall refer to the Contract Documents regarding equipment shop testing requirements.

B. After completing the installation, the Contractor shall test the system in the presence of the Engineer and under actual operating conditions. Tests shall be performed according to the manufacturer's recommendations.

C. The Contractor shall include with its bid the services of the equipment manufacturer's field service technician for a period necessary to complete the Work to the satisfaction of the Engineer and the Owner.

D. This service shall be for the purposes of checkout, initial start-up, certification, and instruction of facilities personnel.

E. A written report covering the technician's findings and installation approval shall be submitted to the Engineer covering all inspections and outlining in detail any deficiencies noted.

1.11 ACCEPTANCE OF INSTALLATION

A. The Engineer may accept an equipment system installation as ready for Substantial Completion when:

1. The Engineer has accepted all factory tests and all other component testing.
2. The Engineer has accepted all performance shop tests.
3. All components of the system are installed and tested, including without limitation hydrostatic tests, leak tests, continuity tests, insulation resistance tests, phase rotation tests, bump tests, stroke testing, calibration, adjustment for proper operation, and all other component tests as appropriate.
4. Field start-up activities have been completed and approved by the Engineer.
5. The appropriate certificates have been submitted.
6. All equipment has met the performance requirements.
7. The Engineer has accepted integrated system tests and adjustments performed by the Contractor to demonstrate that the system as a whole functions reliably and meets the performance requirements, in manual and automatic modes, without failure, fault, or defect of any component or of the system as a whole.
8. The Engineer has accepted integrated facilities tests performed by the Contractor to demonstrate that the entire Construction functions together reliably as an integrated facility and meets the performance requirements, in manual and automatic modes, without failure, fault, or defect of any component.
9. The Engineer has accepted facilities performance tests which demonstrate that the design criteria and performance criteria are met.
10. The Engineer has accepted the O&M Manuals.
11. All required Owner personnel have been trained.
12. All other Contract requirements for Substantial Completion have been satisfied.

1.12 GREASE, OIL, AND FUEL

A. All grease, oil, and fuel required for start-up and testing of equipment shall be furnished with the respective equipment.

B. The Contractor shall be responsible for changing the oil in all drives and intermediate drives of each mechanical equipment from after initial break-in of the equipment, which shall be no greater than 30 days.

1.13 ELECTRICAL EQUIPMENT ENCLOSURES

A. All items of electrical equipment that are furnished with process, heating, ventilating, or other equipment shall conform to the requirements as applicable. Enclosures for electrical equipment, such as switches and starters, shall conform to the requirements as applicable.

1.14 EQUIPMENT DRIVE GUARDS

A. Screens, guards, or cages shall be provided for all exposed rotating or moving parts in accordance with accepted practices of applicable governmental agencies. Unless specified otherwise in the technical sections, guards shall be constructed of galvanized sheet steel or galvanized woven wires or expanded metal set in a frame of galvanized steel members. Guards shall be secured in position by steel braces or straps, which will permit easy removal for servicing the equipment.

1.15 PROTECTION AGAINST ELECTROLYSIS

A. Where dissimilar metals are used in conjunction with each other, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous-impregnated felt, heavy -bituminous coatings, nonmetallic separators or washers, or other acceptable materials.

1.16 CONCRETE INSERTS

A. Concrete inserts for hangers shall be designed to support safely, in the concrete that is used, the maximum load that can be imposed by the hangers used in the inserts. Inserts for hangers shall be of a type which will permit adjustment of the hangers both horizontally (in one plane) and vertically and locking of the hanger head or nut. All inserts shall be galvanized.

1.17 SLEEVES

A. Unless otherwise indicated on the Drawings or specified, openings for the passage of pipes through floors and walls shall be formed of sleeves of standard-weight, galvanized-steel pipe. Each sleeve shall be of ample diameter to pass the pipe and its insulation, if any, and to permit such expansion as may occur. Sleeves shall be of sufficient length to be flush at the walls and the bottom of the slabs and to project 2 inches above the finished floor surface. Threaded nipples shall not be used as sleeves.

B. Sleeves in exterior walls below ground or in walls to have liquids on one or both sides shall have a 2-inch annular fin of 1/4-inch plate welded with a continuous weld completely around the sleeve at about mid-length. Sleeves shall be galvanized after the fins are attached.

C. All sleeves shall be set accurately before the concrete is placed or shall be built-in accurately as the masonry is being built.

1.18 SERVICES OF MANUFACTURER'S REPRESENTATIVE

A. The Contractor shall arrange for a qualified service representative from each company manufacturing or supplying certain equipment as listed in this Section (or in the respective Technical Specification sections) to perform the duties described in this Section.

B. After the listed equipment has been installed and the equipment is presumably ready for operation but before it is operated by others, the representative shall inspect, operate, test, and adjust the equipment. The inspection shall include but not be limited to the following points as applicable:

1. Soundness (without cracked, abraded, or otherwise damaged parts).
2. Completeness in all details, as specified.
3. Correctness of setting, alignment, and relative arrangement of various parts.
4. Adequacy and correctness of packing, sealing, and lubricants.

C. The operation, testing, and adjustment shall be as required to prove that the equipment is left in proper condition for satisfactory operation under the conditions specified.

D. On completion of his or her work, the manufacturer's or supplier's representative shall submit in triplicate to the Engineer a complete, signed report of the result of the inspection, operation, adjustments, and tests. The report shall include detailed descriptions of the points inspected, tests and adjustment made, quantitative

results obtained if such are specified, and suggestions for precautions to be taken to ensure proper maintenance. The report also shall include a certificate that the equipment conforms to the requirements of the Contract and is ready for permanent operation and that nothing in the installation will render the manufacturer's warranty null and void.

E. After the Engineer has reviewed the reports from the manufacturer's representatives, the Contractor shall make arrangements to have the manufacturer's representatives present when the field acceptance tests are made.

F. The Contractor, at a minimum, shall arrange for the service of qualified service representatives from the companies manufacturing or supplying the following equipment and as required in the Technical Specifications:

1. Pumping Equipment.
2. Instrumentation and Control Systems.
3. Programmable Controllers.
4. Hoisting Equipment.
5. Electric Motors.
6. Motor Control Centers.
7. Flow Meters.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01650
DELIVERY, STORAGE, AND HANDLING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section specifies the general requirements for the delivery, handling, storage, and protection of all items required in the construction of the Work. Specific requirements, if any, are specified with the related item.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in this Section for storing and protecting the items.

B. The Contractor shall do the following:

1. Materials and equipment shall be loaded and unloaded by methods affording adequate protection against damage. Every precaution shall be taken to prevent injury to the material or equipment during transportation and handling. Suitable power equipment shall be used and the material or equipment shall be under control at all times. Under no condition shall the material or equipment be dropped, bumped, or dragged. When a crane is used, a suitable hook or lift sling shall be used. The crane shall be so placed that all lifting is done in a vertical plane. Materials or equipment skid loaded, palletized, or handled on skidways shall not be skidded or rolled against material or equipment already unloaded.

2. Material and equipment shall be delivered to the job site by means that will adequately support it and not subject it to undue stresses. Material and equipment damaged or injured in the process of transportation unloading or handling shall be rejected and immediately removed from the site.

3. The Contractor shall coordinate the delivery of all materials, including those furnished by the Owner. The Contractor shall be responsible for the proper transport, handling, and storing of all materials, and materials shall be protected to ensure their expected performance. Delivery schedules

shall be coordinated by the Contractor, in advance, so that the Work will be done in a timely manner.

4. The Contractor shall coordinate deliveries of products with construction schedules to avoid conflict with work and conditions at the site. The Contractor shall also do the following:

    a. Deliver products in undamaged condition, in the manufacturer's original containers or packaging, with identifying labels intact and legible.
    b. Immediately on delivery, inspect shipments to ensure compliance with requirements of the Contract Documents and approved submittals and to ensure that the products are properly protected and undamaged.

5. The Contractor shall provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

6. All materials and equipment shall be stored on-site in complete compliance with the manufacturer’s recommendations.

7. Store products subject to damage by the elements in weather-tight enclosures.

8. Maintain temperature and humidity within the ranges required by the manufacturer's instructions.

9. Store fabricated products above the ground, on blocking or skids to prevent soiling or staining. Cover products that are subject to deterioration with impervious sheet coverings, and provide adequate ventilation to avoid condensation.

10. All materials and equipment to be incorporated in the Work shall be handled and stored by the Contractor before, during, and after shipment in a manner that will prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft, or damage of any kind to the material or equipment.

11. All materials which, in the opinion of the Engineer, have become so damaged as to be unfit for the use intended or specified shall be promptly removed from the site of the Work, and the Contractor shall receive no compensation for the damaged material or its removal.

12. The Contractor shall arrange storage in a manner to provide easy access for inspection and make periodic inspections of stored products to ensure that products are maintained under specified conditions, free from damage or deterioration.

13. The Contractor shall provide substantial coverings as necessary to protect installed products from traffic damage and subsequent construction operations and shall remove these coverings when they are no longer needed.

14. Should the Contractor fail to take proper action on storage and handling of equipment supplied under this Contract, within 7 days after written notice to do so has been given, the Owner retains the right to correct all deficiencies noted in the previously transmitted written notice and deduct the cost associated with these corrections from the Contractor's Contract. These costs may include expenditures for labor, equipment use, administrative, clerical, engineering, and any other costs associated with making the necessary corrections.

15. Schedule delivery to reduce long-term onsite storage before installation and/or operation. Under no circumstances shall equipment be delivered to the site more than 1 month before installation without written authorization from the Engineer.

16. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged, or sensitive to deterioration.

17. Deliver products to the site in the manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting, and installing.

18. Unload and place all items delivered to the site in a manner which will not hamper normal construction operation nor that of subcontractors and other contractors and will not interfere with the flow of necessary traffic.

19. Provide necessary equipment and personnel to unload all items delivered to the site.

20. The Contractor shall store and protect products in accordance with the manufacturer's instructions, with seals and labels intact and legible. Follow storage instructions, review them with the Engineer, and keep a written record of this. Arrange storage to permit access for inspection.

21. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

22. Store cement and lime under a roof and off the ground and keep it completely dry at all times. All structural, miscellaneous, and reinforcing steel shall be stored off the ground or otherwise to prevent accumulations of dirt or grease and in a position to prevent accumulations of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping, or cracking. Handle and store brick, block, and similar masonry products in a manner to keep breaking, cracking, and spilling to a minimum.

23. Store all mechanical and electrical equipment and instruments subject to corrosive damage by the atmosphere if stored outdoors (even though covered by canvas) in a weathertight building to prevent damage. The building may be a temporary structure on the site or elsewhere, but it must be satisfactory to the Engineer. The building shall be provided with adequate ventilation to prevent condensation. The Contractor shall ensure that temperature and humidity are maintained within the range required by the manufacturer.

    a. All equipment shall be stored fully lubricated with oil, grease, and other lubricants unless otherwise instructed by the manufacturer.
    b. Moving parts shall be rotated a minimum of once weekly to ensure proper lubrication and to avoid metal-to-metal "welding." Upon installation of the equipment, the Contractor shall start the equipment, at least at half load, once weekly for an adequate period to ensure that the equipment does not deteriorate from lack of use.
    c. Lubricants shall be changed when installation is complete and as frequently as required thereafter during the period between installation and acceptance. The Contractor shall put new lubricants into the equipment at the time of acceptance.
    d. Before accepting equipment that has been stored for some time, the Contractor shall have the manufacturer inspect the equipment and certify that its condition has not been detrimentally affected by the long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested, and accepted in a minimum time period. As such, the manufacturer will guarantee the equipment equally in both instances. If such a certification is not

given, the equipment shall be judged to be defective. It shall be removed and replaced at the Contractor's expense.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01720
FIELD ENGINEERING

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall do the following:

A. Provide and pay for the following field engineering services required for the Project:

1. Survey work required in the execution of the Project.
2. Civil, structural, or other professional engineering services specified or required to execute the Contractor’s construction methods.

B. Retain the services of a registered land surveyor licensed in Florida to do the following:

1. Identify existing control points and property line corner stakes as required.
2. Verify all existing structure locations and all proposed structure corner locations, tank locations, and equipment locations within the Project site.
3. Maintain an accurate location of all buried piping 4 inches in diameter and larger.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. The Contractor shall submit to the Engineer the name and address of the registered land surveyor or professional engineer.

C. On request of the Engineer, the Contractor shall submit documentation to verify the accuracy of field engineering work.

D. The Contractor shall submit a certificate signed by a registered land surveyor certifying that elevations and locations of improvements are in conformance or non-conformance with Subcontract Documents.

E. At the end of the Project and before final payment, submit the certified drawings listed below with the Surveyor's title block (signed and sealed by the registered

land surveyor) of the items listed below. These drawings shall be included with and made a part of the project record documents.

1. Certified site survey at 1-inch = 10-foot scale on sheets 24 inches by 36 inches, indicating the building corners, sidewalks, paved areas, and location of all above-ground structures for the project site.
2. Certified drawing showing the location, lines, and grades of all lines 4 inches in diameter and larger buried and exterior to buildings and other buried facilities (e.g., valves, tanks, vaults) installed as a result of the work. This shall be at the same scale as the Engineer's yard piping drawing and submitted on reproducible tracing paper.
3. Certified drawings showing elevations of all flow control points such as weirs, elevations of all existing and new structures, and equipment.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. All work will be performed in accordance with the Minimum Technical Standards set forth by the Board of Professional Surveyors and Mappers.

1.04 QUALITY ASSURANCE

A. Existing basic horizontal and vertical control points for the project are those designated on Drawings.

B. Locate and protect control points before starting site work and preserve all permanent reference points during construction:

1. Make no changes or relocations without prior written notice to the Engineer.
2. Report to the Engineer when any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.
3. Require the surveyor to correctly replace project control points which may be lost or destroyed.
4. Establish replacements based on original survey control.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 QUALIFICATIONS

A. Registered land surveyor of the discipline required for the specific service on the project, currently licensed in Florida.

1.08 SYSTEM DESCRIPTION

A. The Contractor shall establish a minimum of five (5) permanent benchmarks on the site, referenced to data established by survey control points:

1. Record locations, with horizontal and vertical data, on Record Documents.

B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:

1. Site improvements:

a. Stakes for grading, fill, and topsoil placement.
b. Utility slopes and invert elevations.

2. Foundation and floor levels.

3. Controlling lines and levels required for mechanical and electrical trades.

C. From time to time, verify layouts by the same methods.

D. Maintain a complete and accurate log of all control and survey work as the work progresses.

E. As a condition for approval of monthly progress payment requests, update the project record drawings monthly based on the work performed during the month ending at the pay request. The Contractor shall coordinate this monthly with the Owner's representative on the site as part of the pay request.

F. Maintain an accurate record of piping changes, revisions, and modifications.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01740
FINAL CLEANING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall execute cleaning during progress of the Work and at the completion of the Work as required by General Conditions.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 ENVIRONMENTAL CONCERNS

A. Cleaning and disposal operations shall comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 PRODUCTS

2.01 CLEANING MATERIALS

The Contractor shall do the following:

A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by the manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by the cleaning material manufacturer.

PART 3 EXECUTION

3.01 PERIODIC CLEANING

The Contractor shall do the following:

A. Execute periodic cleaning to keep the work, the site, and adjacent properties free from accumulations of waste materials, rubbish, and windblown debris.

B. Provide onsite containers for the collection of waste materials, debris, and rubbish.

C. Remove waste materials, debris, and rubbish from the site periodically and dispose of at legal areas away from the site.

3.02 DUST CONTROL

The Contractor shall do the following:

A. Clean interior spaces before the start of finish painting and continue cleaning on an as-needed basis until painting is finished.

B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.

3.03 FINAL CLEANING

The Contractor shall do the following:

A. Employ skilled workers for final cleaning.

B. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from interior and exterior surfaces exposed to view.

C. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.

D. Before final completion or Owner occupancy, inspect interior and exterior surfaces exposed to view and all work areas to verify that the entire Work is clean.

END OF SECTION

SECTION 01770
PROJECT CLOSEOUT

PART 1 GENERAL

1.01 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.02 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.03 SUBSTANTIAL COMPLETION

A. When the Contractor considers that the Work or designated portion of the Work is Substantially Complete, the Contractor shall submit written notice to the Engineer with a list of items to be completed or corrected.

B. If the Engineer's inspection finds that the Work is not substantially complete, the Engineer will promptly notify the Contractor in writing, listing observed deficiencies.

C. The Contractor shall remedy deficiencies and send a second written notice of Substantial Completion.

D. When the Engineer finds the Work is Substantially Complete the Engineer will prepare a Certificate of Substantial Completion.

1.04 FINAL COMPLETION

A. When the Contractor considers that the Work or designated period of the Work is complete, the Contractor shall submit written certification to the Engineer indicating the following:

1. The Contract Documents have been reviewed.
2. The Work has been inspected for compliance with the Contract Documents.

3. The Work has been completed in accordance with the Contract Documents and deficiencies listed with Certificates of Substantial Completion have been corrected.
4. The Work is complete and ready for final inspection.
5. All required shop drawings, catalog cuts, maintenance manuals, instruction manuals, test reports, samples, operational manuals, and all other submittals have been submitted and reviewed by the Engineer.
6. All deliverables have been delivered or placed as accepted by the Engineer.

B. If the Engineer's inspection reveals that the Work is incomplete, the Engineer will promptly notify the Contractor in writing listing observed deficiencies.

C. The Contractor shall remedy deficiencies and send a second certification of Final Completion.

D. When the Engineer finds that the Work is complete, the Engineer will consider closeout submittals.

1.05 REINSPECTION FEES

A. If the status of Completion of Work requires more than one re-inspection by the Engineer due to failure of the Work to comply with the Contractor's claims on initial inspection, the Owner will deduct from the final payment to the Contractor the amount of the Engineer's compensation for additional re-inspection services.

1.06 CLOSEOUT SUBMITTALS

A. Evidence of Compliance with Requirements of Governing Authorities:

1. Certificate of Occupancy.
2. All required Certificates of Inspection.

B. Operation and Maintenance Manuals: Under provisions of Section 01830, Operations and Maintenance Manuals.

C. Record Documents: Under provisions of Section 01785, Record Documents.

D. Evidence of Payment and Release of Liens: In accordance with Conditions of the Contract.

E. Consent of Surety to Final Payment.

1.07 STATEMENT OF ADJUSTMENT OF ACCOUNTS

A. Submit final statement reflecting adjustments to total Contract Price, indicating the following:

1. Original total Contract Price.
2. Previous change orders.
3. Changes under allowances.
4. Changes under unit prices.
5. Deductions for uncorrected Work.
6. Penalties and bonuses.
7. Deductions for liquidated damages.
8. Deductions for re-inspection fees.
9. Other adjustments to total Contract Price.
10. Total Contract Price as adjusted.
11. Previous payments.
12. Sum remaining due.

B. The Engineer will issue a final Change Order reflecting approved adjustments to the total Contract Price not previously made by change orders.

1.08 APPLICATION FOR FINAL PAYMENT

A. Submit application for final payment in accordance with provisions of Conditions of the Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01780
WARRANTIES AND BONDS

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall do the following:

A. Compile specified warranties and bonds.
B. Co-execute submittals when so specified.
C. Review submittals to verify compliance with Contract Documents.
D. Submit submittals to the Engineer for review.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Assemble warranties, bonds, and service and maintenance contracts executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Number of original signed copies required: two each.

C. Table of Contents: Neatly typed, in sequence of the Specifications. Provide completion information for each item as follows:

1. Product or work item.

2. Firm, address, telephone and fax numbers, and name and email of principal.

3. Scope.

4. Date of beginning of warranty, bond, or service and maintenance contract.

5. Duration of warranty, bond, or service and maintenance contract.

6. Provide information for Owner's personnel:

a. Proper procedure in case of failure.
b. Instances that might affect the validity of warranty or bond.

7. Contractor, with address, telephone and fax numbers, and the name and email of responsible principal.

D. Submittal of warranties, bonds, and service and maintenance contracts shall be included in submittals for review and before Final Completion with actual dates included.

E. The Contractor's obligation to correct defective or nonconforming Work shall run for 1 year (or such longer period may otherwise be specified in the Contract Documents) beginning from the date Substantial Completion is achieved.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and this Section.

B. All mechanical and electrical equipment together with devices of whatever nature and all components which are furnished and/or installed by the Contractor shall be guaranteed.

C. The guarantee shall be against the manufacturing and/or design inadequacies, materials, and workmanship not in conformity, improper assembly, hidden damage, failure of devices and/or components, excessive leakage, or other circumstances which would cause the equipment to fail under normal design and/or specific operating conditions for 1 year or such longer period as may be shown and/or specified from and after the date of Substantial Completion.

D. The Contractor shall replace and install each piece of equipment, device, or component which shall fail within the term specified above of the guarantee with reasonable promptness without increase in the Contract Price. If the Contractor fails to provide timely repairs as specified in this Section, the Owner shall issue a claim against the Contractor's Bond. In some instances, if approved by the Owner, the Contractor may be allowed to repair the equipment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01785
RECORD DOCUMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section details the minimum requirements for the Contractor for maintenance and recording of Record Documents.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. The Contractor shall store documents and samples in the Contractor's field office apart from documents used for construction and shall do the following:

1. Provide files and racks for storage of documents.
2. Provide cabinet or secure storage space for storage of samples.

B. The Contractor shall institute a computerized record control program.

C. The Contractor shall make documents and samples available at all times for inspection by the Engineer.

D. At Contract closeout, the Contractor shall transmit Record Documents and samples with cover letter to the Engineer, listing the following:

1. Date.
2. Project title and number.
3. Contractor's name and addresses.
4. Number and title of each Record Document.
5. Signature of Contractor or its authorized representative.
6. Contract Section and Subsection numbers.
7. Location.

E. Before assembling and submitting records, the Contractor shall review for completeness the records maintained by its subcontractors.

F. Tracings of all Construction Documents and Shop Drawings made by the Contractor, subcontractors, and suppliers of materials or equipment shall be corrected to show the Work as actually completed or installed.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 PROJECT RECORD

A. The Contractor shall label and file Record Documents and samples in accordance with the corresponding Specification Section number. Each document shall be labeled “PROJECT RECORD” in neat, large, printed letters. Record Documents shall be maintained in a clean, dry, and legible condition. Record documents shall not be used for construction purposes.

3.02 RECORDING

The Contractor shall record construction information as follows:

A. Record and update daily Record information from field notes on a set of opaque drawings and to the satisfaction of the Engineer.

B. Provide felt tip marking pens, maintaining separate colors for each major system, for recording information.

C. Record information concurrently (daily) with construction progress. Work shall not be concealed until required information is recorded.

D. Mark Record Drawings to reflect the following:

1. Measured horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements.
2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
3. Field changes of dimension and detail.

4. Changes made by modifications.
5. Details not on original construction drawings.

E. CAD Requirements for Record Drawings: The Contractor shall provide the Engineer with a complete set of Record Drawings in the version of AutoCAD format specified by the Engineer upon completion of the Work. No additional compensation will be allowed for the Contractor to provide the Record Drawings. The Contractor shall use the AutoCAD drawings furnished by the Engineer for this purpose. Record Drawings must be submitted in the AutoCAD format of the contract drawings. No other CAD software or format will be accepted. It is Contractor's sole responsibility to ensure that the Record Drawings conform to the following CAD requirements:

1. Drawings shall be submitted to the Engineer on CD-ROM. Each CD shall be clearly labeled with the appropriate project number, client name, date, and file names included on each CD. If files are compressed, a description of the compression software must be included along with a copy of the appropriate uncompressing software.
2. All changes to drawings must be done in accordance with the appropriate scale of the drawing revised and shall be delineated by placing a "cloud" around the areas revised and adding a revision triangle indicating the appropriate revision number.
3. Each drawing must have the revision block completed to indicate the revision number, date, and initials of the person revising the drawing. The description of the revision must say "Record Drawing." This procedure must be followed for every drawing even when no changes are made to the drawing.
4. All revisions to drawings must be put on separate layers with the layer names prefixed Record followed by the appropriate existing layer name. The colors and line types of the appropriate existing layers shall be adhered to when creating new layers.
5. The Contractor shall supply one full set of Record Drawings on reproducible black line prints and five full sets of opaque copies.

F. The Contractor shall have the Licensed Land Surveyor certify the Record Drawings as being correct and complete.

END OF SECTION

SECTION 01830
OPERATIONS AND MAINTENANCE MANUALS

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall do the following:

A. Compile product data and related information appropriate for the Owner's maintenance and operation of products furnished under the Contract.

1. Prepare operating and maintenance data as specified in this Section and as referenced in other pertinent Sections of the Specifications. The data presented in the Operations and Maintenance (O&M) Manuals shall be specifically related to this Contract and application.
2. Incorporate maintenance and operation data furnished by the Owner, if any.

B. Furnish all labor, equipment, materials, and all other items to supply and deliver to the Engineer O&M Manuals for the Work in accordance with the requirements of this Section.

C. Provide O&M Manuals for all equipment, including instrumentation, electrical, and process control system equipment and software for the entire Facility.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Manuals which, in general, shall have two levels: a facilities-wide systems level and an individual-component level.

1. The facilities-wide systems level shall do the following:

a. Describe the facilities-wide systems, including diagrams.
b. Explain start-up, shutdown, normal operations, and malfunctions of the facilities-wide systems.
c. Tabulate a lubrication schedule for the facilities-wide systems.
d. Describe preventive maintenance checking procedures for the facilities-wide systems.
e. Include a cross-reference to all individual component manuals.

2. The individual-component level shall contain the following:

    a. Storage requirements.
    b. Installation instructions.
    c. Alignment instructions and tolerances.
    d. Operating instructions.
    e. Troubleshooting instructions.
    f. Lubrication requirements.
    g. Maintenance instructions.
    h. Parts list.
    i. Recommended spare parts list and how to obtain same.

B. Format

1. Size: 8 1/2 x 11 inch (21.59 x 27.94 cm).

2. White paper: 20-lb (9.072 kg) minimum.

3. Text: Manufacturer's printed data or neatly word-processed.

4. Drawings:

    a. Provide reinforced, punched binder tab, bind in with text.
    b. Reduce larger drawings and fold to size of text pages but not larger than 11 x 17 inches (27.94 x 43.18 cm).
    c. Place all drawings at the end of each Section and drawing shall be printed on one side only.

5. Provide a blank page for each separate product or each piece of operation equipment.

    a. Provide a word-processed description of the product and major component parts of equipment.
    b. Provide indexed tabs.

6. Cover: Identify each volume with typed or printed title, "OPERATION AND MAINTENANCE INSTRUCTIONS," listing the following:

    a. Title of Project.
    b. Identity of separate structure as applicable.
    c. Identity of general subject matter covered in the manual.

C. Media

1. Original word-processed CD shall be delivered to the Engineer.
2. All word processing must be done using the latest version of Microsoft Word or as directed by the Engineer.
3. All drawings except control system configuration drawings must be submitted on CD using AutoCAD.

D. Binders

1. Filled to not more than 75% capacity.
2. When multiple binders are used, arrange the data into related consistent groupings.

E. The Contractor shall submit the following:

1. Preliminary O&M Manuals—Five copies of the O&M Instruction Manual for each piece of equipment shall be submitted to the Engineer before delivery of the equipment for review by the Engineer. O&M manuals will not include the manufacturer's test results and Record specifications.
2. Final O&M Manuals—Five copies of the Final Equipment and Systems O&M Manuals, bound and indexed and submitted to the Engineer before the Substantial Completion under this Contract.
3. The cost of these Manuals submitted shall be included in the total Contract Price. Copies supplied under Item 1 will not be included under Item 2.

F. Any modifications required after final O&M submission shall be made to the manuals by issuance of addenda in the form of change pages to the manual. The addenda will identify where the new data are to be inserted, what data are to be removed, and new index sheets as necessary and list of shop drawings and submittals.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to herein shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Administrative Code, 62-555.350, "Operation and Maintenance of Public Water Systems."

B. Florida Administrative Code, 62-600.410, "Operation and Maintenance of Domestic Wastewater Facilities."

1.04 QUALITY ASSURANCE

A. Data shall be prepared by personnel:

1. Trained and experienced in maintaining and operating the described products.
2. Familiar with requirements of this Section.
3. Skilled as a technical writer to the extent required to communicate essential data.
4. Skilled as a draftsman competent to prepare required drawings.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 CONTENTS, EACH VOLUME

A. Neatly word-processed table of contents for each volume, arranged in systematic order, to include the following:

1. Contractor, name of responsible principal, address, fax number, and telephone number.

2. A list of each product required to be included, indexed to content of the volume.

3. A list with each product, name, address, fax number, and telephone number of the following:

a. Subcontractor or installer.
b. A list of each product to be included, indexed to content of the volume.
c. Identify area of responsibility of each subcontractor or installer, if more than one.
d. Local source of supply for parts and replacement.
e. Manufacturer.

4. Identify each product by product name and other identifying symbols as set forth in the Contract Documents.

B. Product Data

1. Include only those sheets that are pertinent to the specific product.

2. Annotate each sheet to achieve the following:

a. Clearly identify the specific product or part installed.
b. Clearly identify data applicable information.
c. Delete references to inapplicable information.

C. Drawings

1. Supplement product data with drawings as necessary to illustrate the following clearly:

a. Relations of component parts of equipment and systems.
b. Control and flow diagrams.
c. Owner Tag Numbers.

2. Coordinate drawings with information in Record Documents to ensure correct illustration of completed installation.

3. Do not use Record Documents as maintenance drawings.

D. Written text as required to supplement product data for the particular installation:

1. Organize in consistent format under separate headings for different procedures.
2. Provide a logical sequence of instructions for each procedure.
3. Describe how the complete system is to operate.

E. Copy of pertinent information related to warranty, bond, and service Contract issued.

1. Provide information sheet for Owner's personnel with the following information:

a. Proper procedures in event of failure.
b. Instances that might affect the validity of warranties or bonds.

F. Training manuals used in training courses will become part of this Manual.

1.08 MANUAL FOR MATERIALS AND FINISHES

A. Content, for applied materials and finishes:

1. Manufacturer's data, giving full information on products:

a. Catalog number, size, composition.
b. Color and texture designations.
c. Information required for re-ordering special-manufactured products.

2. Instructions for care and maintenance:

a. Manufacturer's recommendation for types of cleaning agents and methods.
b. Cautions against cleaning agents and methods that are detrimental to product.
c. Recommended schedule for cleaning and maintenance.

B. Content, for moisture-protected and weather-exposed products:

1. Manufacturer's data, giving full information on products:

a. Applicable standards.
b. Chemical composition.
c. Details of installation.

2. Instructions for inspection, maintenance, and repair.

C. Additional requirements for maintenance data as required by other Sections of the Specifications.

1.09 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Content, for each electrical, mechanical, instrumentation, and communication system, as appropriate:

1. A table identifying each piece of equipment, each associated control or instrument, the location of the control or instrument, and the function of the control or instrument.

2. A description of the system and its component parts:

    a. Function, normal operating characteristics, and limiting conditions for the system, the sub-system, and the component parts.
    b. Performance curves, engineering data, and tests.
    c. Complete nomenclature and commercial numbers of replaceable parts.

3. Circuit directories of panel board:

    a. Electrical service.
    b. Controls.
    c. Communications.

4. As-installed color-coded wiring diagrams.

5. Instrument loop diagrams showing the path that a control or instrumentation signal takes from its origin to the action it takes.

    a. An electrical schematic for each item.
    b. A chart listing the controls/instruments in a loop identifying the equipment's abbreviated symbol, a description of the symbol, design criteria, process flow, quantity supplied, and manufacturer's model and serial number.

6. Operating procedures:

    a. Routine and normal operating instructions.
    b. Sequences required.
    c. Special operating instructions.

7. Maintenance procedures:

    a. Routine operations.
    b. Guide to "trouble-shooting."
    c. Disassembly, repair, and re-assembly.
    d. Alignment, adjustment, and checking.

8. The manufacturer's printed operating and maintenance instructions.

9. A list of the original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

10. Other data as required under other Sections of the Specifications.

11. Abnormal and emergency operations:

    a. Potential overloads.
    b. Procedures for equipment breakdown.
    c. Action to be taken in a power outage.
    d. Identity of alarms by equipment location and action to correct.
    e. Equipment safety features, requirements, and potential hazards.

12. Programming manuals for programmable devices including list of standard programming.

B. Content, for each unit of equipment and system, as appropriate:

1. Description of unit and component parts:

    a. Function, normal operating characteristics, and limiting conditions.
    b. Performance curves, engineering data, and tests.
    c. Complete nomenclature and commercial number of replaceable parts.
    d. Model number and name plate data for each piece of equipment.
    e. Assembly drawings.
    f. List of all special tools required to service equipment and/or systems including where the tools are stored.

2. Operating procedures:

    a. Start-up, break-in, routine, and normal operating instructions.
    b. Regulation, control, stopping, shut-down, and emergency instructions.
    c. Summer and winter operating instructions.
    d. Special operating instructions.
    e. Control settings and ranges.

3. Maintenance procedures:

    a. Type and frequency of preventive maintenance activities required for each piece of equipment.
    b. Guide to "trouble-shooting."
    c. Disassembly, repair, and re-assembly.
    d. Alignment, adjusting, and checking.

4. Servicing and lubrication schedule:

    a. List of lubricants required.
    b. Period between lubrications.

5. Manufacturer's printed operating and maintenance instructions. (This is not to be a generalized catalog of the entire product line.)

6. Description of sequence of operation.

7. The original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance:

    a. Predicted life of parts subject to wear.
    b. Items recommended to be stocked as spare parts.

8. As-installed control diagrams.

9. Each Contractor's coordination drawings.

10. List of the original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

11. Other data as required under pertinent Sections of the Specifications.

12. Charts of equipment, instrument, and valve tag numbers with location and function:

    a. Reference drawing which shows equipment, instrument, or valve location.
    b. Manufacturer's model and serial number.
    c. Valve actuator type (manual, hydraulic, electric, or pneumatic).

13. Local services (process water and air, drains, HVAC, natural gas and steam).

C. The Contractor shall prepare and include additional data when the need for such data becomes apparent during instruction of the Owner's personnel.

D. Additional requirements for O&M data required by other Sections of the Specifications.

PART 2 PRODUCTS

2.01 O&M MANUALS

A. Binders: The manuals shall be supplied in binders that are the same as those provided in Paragraph 1.03.D above.

B. Electronic Version: Word-processed portions of the manuals shall also be provided on CDs. The electronic version manuals must be capable of being read, edited, and printed with Microsoft Word or Owner-approved file format at the time of the transmittal of documents. The format will be provided to the Contractor upon request. All drawings shall be generated using personal computer and plotter with the software package program from AutoCAD.

PART 3 EXECUTION (NOT USED)

END OF SECTION

DIVISION 2

SITE CONSTRUCTION

SECTION 02000
REFERENCED FDOT SPECIFICATIONS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to provide for the construction where indicated on the Drawings.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product data for reinforced concrete pipe, along with gaskets, is required to indicate performance in accordance with the specifications.

B. Shop drawings for drainage structures including curb inlets, ditch bottom inlets, manholes, and mitered end sections is required to indicate performance in accordance with the specifications. Include shop drawings for frames, covers, and grates with each drainage structure.

C. Submit maintenance of traffic plan(s) for each phase of construction.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Specification Section shall be the latest revision of any such document in effect at the bid time, unless otherwise noted. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section. The referenced FDOT Standard Specifications that apply to this project include the following sections along with the sections referenced within these sections:

- 102 Maintenance of Traffic

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this Contract.

2. Payment for this project is in accordance with the Bid Form.
3. Additional requirements superseding the applicable portions of the above FDOT Standard Specifications are provided in the subsequent sections of these Technical Specifications.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Specification Section 01780, Warranties and Bonds.

PART 2 PRODUCTS

2.01 GENERAL

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section. The referenced FDOT Standard Specifications that apply to this project include the following sections along with the sections referenced within these sections:

- 102 Maintenance of Traffic

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this contract.
2. Payment for this project is in accordance with the Bid Form.
3. Additional requirements superseding the applicable portions of the above FDOT Standard Specifications are provided in the subsequent sections of these Technical Specifications.

PART 3 EXECUTION

3.01 GENERAL

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section. The referenced FDOT

Standard Specifications that apply to this project include the following sections along with the sections referenced within these sections:

- 102 Maintenance of Traffic

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this contract.
2. Payment for this project is in accordance with the Bid Form.
3. Additional requirements superseding the applicable portions of the above FDOT Standard Specifications are provided in the subsequent sections of these Technical Specifications.

END OF SECTION

SECTION 02230
SITE PREPARATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, and equipment required and perform all site preparation, complete as shown on the Drawings and as specified in this Section.

B. The Contractor shall obtain all permits required for site preparation before proceeding with the work, including clearing and tree removal.

C. The areas to be cleared, grubbed, and stripped within public rights-of-way and utility easements shall be minimized to the extent possible for the scope of pipeline work and in consideration of the actual means and methods of construction used. No unnecessary site preparation shall be performed within these areas.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. Submit to the Engineer copies of all permits required before clearing, grubbing, and stripping work.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 CLEARING

A. The Contractor shall cut and remove all timber, trees, stumps, brush, shrubs, roots, grass, weeds, rubbish, and any other objectionable material resting on or protruding through the surface of the ground.

B. The Contractor shall preserve and protect trees and other vegetation designated on the Drawings or directed by the Engineer to remain as specified below.

3.02 GRUBBING

A. The Contractor shall grub and remove all stumps, roots in excess of 1-1/2 inches in diameter, matted roots, brush, timber, logs, concrete rubble, and other debris encountered to a depth of 18 inches below original grade or 18 inches beneath the bottom of foundations, whichever is deeper.

B. The Contractor shall refill all grubbing holes and depressions excavated below the original ground surface with suitable materials and compact to a density conforming to the surrounding ground surface in accordance with Section 02305, Earthwork for Utilities.

3.03 STRIPPING

A. The Contractor shall strip topsoil from all areas to be occupied by buildings, structures, and roadways and all areas to be excavated or filled.

B. Topsoil shall be free from brush, trash, large stones, and other extraneous material. Avoid mixing topsoil with subsoil.

C. The Contractor shall stockpile and protect topsoil until it is used in landscaping, loaming, and seeding operations and dispose of surplus topsoil after all work is completed.

3.04 DISPOSAL

A. Dispose of material and debris from site preparation operations by hauling such materials and debris to an approved off-site disposal area. No rubbish or debris of any kind shall be buried on the site.

B. Burning of cleared and grubbed materials or other fires for any reason will not be permitted.

3.05 PROTECTION

A. Trees and other vegetation designated on the Drawings or directed by the Engineer to remain shall be protected from damage by all construction operations by erecting suitable barriers, guards and enclosures, or by other approved means. The Contractor shall conduct clearing operations in a manner to prevent falling trees from damaging trees and vegetation designated to remain and to the work being constructed. The Contractor shall provide for the safety of employees and others.

B. The Contractor shall maintain protection until all work in the vicinity of the work being protected has been completed.

C. The Contractor shall not operate heavy equipment or stockpile materials within the branch spread of existing trees.

D. The Contractor shall immediately repair any damage to existing tree crowns, trunks, or root systems. Roots exposed and/or damaged during the work shall immediately be cut off cleanly inside the exposed or damaged area. Treat cut surfaces with an acceptable tree wound paint and topsoil spread over the exposed root area.

E. When work is completed the Contractor shall remove all dead and downed trees. Live trees shall be trimmed of all dead and diseased limbs and branches. All cuts shall be cleanly made at their juncture with the trunk or preceding branch without injury to the trunk or remaining branches. Cuts over 1 inch in diameter shall be treated with an acceptable tree wound paint.

F. The Contractor shall restrict construction activities to those areas within the limits of construction designated on the Drawings, within public rights-of-way, and within easements provided by the Owner. Adjacent properties and improvements on these properties, public or private, which become damaged by construction operations shall be promptly restored to their original condition to the full satisfaction of the property owner.

G. The Contractor shall remove trees damaged beyond saving, through no fault of the Contractor, as directed by the Engineer.

END OF SECTION

SECTION 02240
DEWATERING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to complete the dewatering activities. All work in this Section shall be done in accordance with the requirements of the Environmental Resource Permit and Water Use Permit (if required) as issued by the Southwest Florida Water Management District (SWFWMD).

B. In addition to the requirements listed in this Section, the Contractor shall obtain, if required, and comply with all requirements of the Generic Permit for the Discharge of Ground Water From Any Non-Contaminated Site Activity as described in FAC 62-621-300.

C. Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control groundwater flow into excavations and permit construction to proceed on dry, stable subgrades.

1. Maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
2. Prevent surface water from entering excavations by grading, dikes, or other means.
3. Remove dewatering system if no longer needed.

D. The Contractor shall dewater so as to prevent damage to existing work. The Contractor shall repair or replace damage resulting from the dewatering activities promptly, remedy environmental damage as approved by the Engineer, and pay any and all fines levied to the Contractor at no additional cost or time to the Owner.

E. The Dewatering Plan shall be signed and sealed by the licensed professional engineer responsible for its preparation.

F. The Contractor shall design the dewatering system. The Contractor shall be responsible for obtaining whatever investigations are necessary, before bidding, to design the dewatering system.

1.02 SUBMITTALS

The Contractor shall submit the following in accordance with Section 01330, Submittals and Acceptance:

A. Before construction, the Contractor shall obtain a dewatering permit from the SWFWMD as required. At a minimum, the dewatering plan submitted with the dewatering application shall include the following:

1. Duration of dewatering for each area.
2. Number and size of pumps.
3. Method of dewatering each area.
4. Methods for routing/containing the discharge.
5. Methods of isolating dewatering areas.
6. Time dewatering structure will be in place.
7. Proposed discharge points.

Five copies of the plan shall be submitted to the Engineer for record purposes only.

B. The Contractor shall be responsible for determining if a Water Use Permit will be required. If a Water Use Permit is required, it is the Contractor's responsibility to obtain the required information from the Engineer and Owner to complete the Water Use Permit application to submit with the Dewatering Plan. If a Water Use Permit is required, the Contractor shall submit five copies of the application to the Owner/Engineer for submittal purposes only.

C. The Contractor shall be responsible for obtaining a Generic Permit for the Discharge of Produced Ground Water from any Non-Contaminated Site Activity as set forth in FDEP Rule 62-621.300(2), FAC. The Contractor shall obtain the required permit form 62-621.300(2) and the required information from the Engineer and Owner to complete the Generic Permit for the Discharge of Produced Ground Water from any Non-Contaminated Site Activity application to submit with the Dewatering Plan. The Contractor shall submit five copies of the application to the Owner/Engineer for submittal purposes only.

D. Provide photographs or videotape, sufficiently detailed, of existing conditions of adjoining properties, facilities, and other construction and site improvements that might be later misconstrued as damage caused by dewatering operations.

E. Submit Record Drawings at Project closeout identifying and locating utilities and other subsurface structural, electrical, or mechanical items encountered during dewatering.

1. Note locations and capping depth of wells and well points.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Administrative Code (FAC)

1. FAC 62-621-300—FDEP – Generic Permits.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with water disposal requirements of authorities having jurisdiction.

B. Pre-installation Conference: Conduct conference at the Project site to present and discuss dewatering means, methods, and monitoring program.

C. Identify a person who shall be present at all times during the execution of this portion of the Work and who shall be thoroughly familiar with the dewatering system being installed for this Project, the referenced standards, environmental and permit requirements, the requirements of this Work, and who shall direct all work performed under this Section.

D. It shall be the responsibility of the Contractor to determine the water levels before and during the dewatering work.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 QUALIFICATIONS

A. The Contractor shall provide at least one person who shall be present at all times during the execution of this portion of the Work and who shall be thoroughly familiar with the dewatering system being installed, the referenced standards, the requirements of this Work, and who shall direct all work performed under this Section.

B. The Contractor shall be responsible for determining the water level before beginning excavation and construction.

1.08 PRE-BID INSPECTION AND TESTING

A. The Contractor is advised that site soil borings may indicate groundwater levels below the levels which may occur in response to normal, seasonal, extreme, or prolonged rainfall. The Contractor is further advised that site soil borings may not necessarily represent soil conditions to be encountered elsewhere on the job site, other than at the specific boring locations.

B. Before bidding, the Contractor shall perform a detailed site inspection and, if desired, obtain the Owner's permission to perform site-specific testing as he deems necessary to obtain all required information relative to project dewatering requirements.

C. The Contractor shall include as part of his Bid the total cost of all surface and subsurface dewatering as required to construct the Project in complete compliance with the Drawings and these Specifications.

1.09 PROJECT CONDITIONS

A. The Contractor shall not interrupt utilities serving facilities occupied by the Owner or others unless approved by the Owner and Engineer and then only after arranging to provide temporary utility services according to requirements indicated.

B. A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of the geotechnical engineer and represent interpretations of subsoil conditions, tests,

and results of analyses conducted by the geotechnical engineer. The Owner will not be responsible for interpretations or conclusions drawn from these data.

1. The Geotechnical Report is included in an Appendix of these specifications.
2. Make additional test borings and conduct other exploratory operations necessary for dewatering.

C. Survey adjacent structures and improvements, employing a professional land surveyor licensed in Florida to establish exact elevations at fixed points to monitor settlement. Clearly identify monitoring points and reference vertical datum, and benchmarks. Monitor and record existing initial elevations.

1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify the Engineer if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction and existing structures.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 DEWATERING SYSTEM

A. The dewatering system shall be adequate to drain the soils to be excavated to the extent that the piezometric water level in the construction area is a minimum of 2 feet below the bottom of the excavation, side slopes of excavations, or bottom of the footings at all times, or as otherwise required to obtain the specified compaction and installation conditions. Pipeline trenches must be dewatered at least 1 foot below the trench bottom.

B. If layered soils are encountered, the hydrostatic head in the zone below the subgrade elevation shall be relieved to prevent uplift.

C. Unless otherwise noted and before any excavating below or within 2 feet above the groundwater level, a dewatering system shall be placed into operation to lower water levels to the extent specified previously and then shall be operated continuously 24 hours a day, 7 days a week, throughout the excavation to maintain and protect all work until the work has been completed to the satisfaction of the Engineer.

D. Where used, well points shall be installed in an Engineer-approved manner and in sufficient numbers to provide the necessary removal of water as stated previously.

Well points and header piping shall be installed so that traffic on public thoroughfares and site access roads will not be impeded.

E. The Contractor shall be solely responsible for the arrangement, location, and depths of the dewatering system necessary to accomplish the specified work. The dewatering system shall stay in full operation until not less than 90% of the total load is applied, as will be determined by the Engineer, or until excavations and trenches have been backfilled and compacted.

F. To prevent excessive noise, exhaust from all pumps and engines shall be silenced and muffled.

G. Wellpoint or surface water pump discharge shall be controlled to prevent erosion, undermining, and all other damage and be piped to approved locations.

H. With the Engineer's assistance, the Contractor is responsible for determining what approvals and permits are required to comply with any and all applicable regulations and permitting requirements relating to dewatering activities. With the Engineer's assistance the Contractor shall obtain all necessary approvals and permits and comply with any and all applicable regulations and permitting requirements concerning all dewatering activities, including pumpage and discharge. The Contractor is solely responsible for all costs associated with the proper implementation of dewatering activities.

I. The Contractor shall perform all dewatering work in strict compliance with Section 01350, Environmental Protection Procedures, and the Contract Drawings.

J. Excavations shall be kept free from water during the placing of concrete and for 36 hours after or until concrete forms are removed.

K. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.

1. Prevent surface water and subsurface or groundwater from entering excavations, ponding on prepared subgrades, or flooding the site and surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

L. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from the Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

M. Install sufficient dewatering equipment to drain water-bearing strata above and below the bottom of foundations. If excavating through layered soils, relieve any potential groundwater hydrostatic head in the zones below to prevent uplift.

1. Open-sump pumping which leads to loss of fines, subgrade softening, and slope instability shall not be permitted.

N. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water in a manner that avoids flooding or accumulation on private property. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

3.02 OBSERVATION WELLS

A. The Contractor shall install observation wells as may be required to record accurate water levels.

B. The Contractor shall be responsible for maintaining all observation wells and observing and recording the elevation of the piezometric water levels daily.

C. Wells damaged or destroyed shall be replaced at no additional cost to the Owner.

3.03 CLEANUP

A. Upon completing dewatering elsewhere on the Project, the Contractor shall remove all equipment and leave the project site in a neat, clean, and acceptable condition satisfactory to the Owner. Wellpoint holes and excavations shall be adequately backfilled and compacted to prevent settlement.

END OF SECTION

SECTION 02300
EARTHWORK FOR STRUCTURES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, equipment, tools, appliances, and materials and perform all operations necessary for the following:

1. Preparing subgrades for slab-on-grade, walks, pavements, and lawns and grasses.
2. Excavating and backfilling for buildings and structures.
3. Laying the subbase course for concrete sidewalks and pavements.
4. Excavating and backfilling for utility trenches.
5. Excavating and backfilling for trenches for buried mechanical and electrical utilities and pits for buried utility structures, as indicated on the Contract Drawings and described in this Section.

1.02 SUBMITTALS

The Contractor shall submit the following shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D2487 of each onsite and borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D1557 for each onsite and borrow soil material proposed for fill and backfill.

B. The Contractor shall submit records before the start of this work. The Contractor shall verify that the existing conditions are correct as shown on the plans and mentioned in these Specifications. The Contractor shall note any discrepancies found immediately and notify the Owner and Engineer. The records shall include the following:

1. The location of all underground utilities, structures, etc. surrounding the areas to be excavated that may be impacted by the work.
2. The location of test excavations.
3. The location of inspections.

C. Testing Agency Invoices indicating if the invoice is for an initial test or a re-test of the Contractor's work.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM C33/C33M—Standard Specification for Concrete Aggregates.
2. ASTM D698—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).
3. ASTM D1556/D1556M—Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
4. ASTM D1557—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).
5. ASTM D2167—Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
6. ASTM D2487—Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
7. ASTM D2937—Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
8. ASTM D2940/D2940M—Standard Specification for Graded Aggregate Material For Bases or Subbases for Highways or Airports.
9. ASTM D3740—Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
10. ASTM D6938—Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
11. ASTM E329—Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

B. Occupational Safety and Health Administration (OSHA)

1. OSHA 2226—Trenching and Excavation Safety.

1.04 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E329 to conduct soil materials and definition testing, as documented according to ASTM D3740.

B. The Contractor shall do the following:

1. Ensure that excavations provide adequate working space and clearance for the work to be performed and for installing piping and buried utilities. In no case shall excavation faces be undercut.
2. Ensure that foundation surfaces are clean and free of loose material of any kind when pipelines and buried utilities are placed on them.
3. Excavate, trench, and backfill in compliance with applicable requirements of governing authorities having jurisdiction.
4. Ensure that shoring and sheeting for excavations are designed by a Florida-registered Professional Engineer and are in accordance with OSHA 2226.
5. Before beginning any excavation or grading, ensure the accuracy of all survey data indicated on the Contract Drawings and in the Specifications and/or as provided. If the Contractor discovers any inaccuracies, errors, or omissions in the survey data, the Contractor shall immediately notify the Owner so that proper adjustments can be anticipated or ordered. If the Contractor begins any excavation or grading, this shall be considered an acceptance of the survey data by the Contractor, after which time the Contractor has no claim against the Owner resulting from alleged errors, omissions, or inaccuracies of the survey data.
6. Ensure that tolerances for excavation are plus or minus 0.10 foot to the required line and to the required grade. Tolerance for compaction of in-place material shall be plus or minus 0.10 foot to the required grade, unless otherwise noted.
7. Remove unsatisfactory materials and unsuitable materials including muck, silts, peat, and other loose and very loose compressible soils from excavations before placing pipe foundation, bedding, and buried utilities.

1.05 PROJECT CONDITIONS

A. Existing Utilities: The Contractor shall not interrupt utilities serving facilities occupied by the Owner or others unless permitted to do so in writing by the Engineer and then only after arranging to provide temporary utility services according to requirements indicated.

1. Notify the Engineer not less than 2 days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without the Engineer's written permission.
3. Contact a utility-locator service and obtain utility locations for the Project area before excavating.

B. The Contractor shall demolish and completely remove from the site underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

1.06 DEFINITIONS

A. *Backfill*: Soil material or controlled low-strength material used to fill an excavation.

1. *Initial Backfill*: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. *Final Backfill*: Backfill placed over initial backfill to fill a trench.

B. *Base Course*: The course placed between the subbase course and hot-mix asphalt paving.

C. *Bedding Course*: The course placed over the excavated subgrade in a trench before laying pipe.

D. *Borrow Soil*: Suitable soil imported from off site for use as fill or backfill.

E. *Drainage Course*: The course supporting the slab-on-grade that also minimizes the upward capillary flow of pore water.

F. *Excavation*: Removing material encountered above subgrade elevations and to lines and dimensions indicated.

1. *Authorized Additional Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
2. *Unauthorized Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Engineer. Unauthorized excavation as well as remedial work directed by the Engineer shall be without additional compensation.

G. *Fill*: Soil materials used to raise existing grades.

H. *Structures*: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. *Subgrade*: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

J. *Utilities*: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

A. General: The Contractor shall provide borrow soil materials when sufficient suitable soil materials are not available from excavations.

B. Suitable Soils: ASTM D2487 Soil Classification Groups SW and SP or a combination of these groups, free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsuitable Soils: Soil Classification Groups GW, GP, GM, GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or a combination of these groups.

1. Unsuitable soils also include satisfactory soils not maintained within 2% of optimum moisture content at time of compaction.

D. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95% passing a 1-1/2-inch sieve and not more than 8% passing a No. 200 sieve.

E. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90% passing a 1-1/2-inch sieve and not more than 12% passing a No. 200 sieve.

F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; except with 100% passing a 1-inch sieve and not more than 8% passing a No. 200 sieve.

G. Sand: ASTM C33/C33M; fine aggregate, natural, or manufactured sand.

H. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

PART 3 EXECUTION

3.01 PREPARATION

A. The Contractor shall protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. The Contractor shall prepare subgrade for earthwork operations including removing vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface as specified in Section 02230, Site Preparation.

C. The Contractor shall protect and maintain erosion and sedimentation controls, which are specified in Section 01350, Environmental Protection Procedures.

3.02 DEWATERING

A. The Contractor shall prevent surface water and groundwater from entering excavations, from ponding on prepared subgrades, and from flooding the Project site and surrounding area.

B. The Contractor shall protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
2. Install a dewatering system**,** specified in Section 02240, Dewatering, to keep subgrades dry and convey groundwater away from excavations. Maintain until dewatering is no longer required.

3.03 EXPLOSIVES

A. Explosives: Do not use explosives.

3.04 EXCAVATION, GENERAL

A. Unclassified Excavation: The Contractor shall excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered.

Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsuitable soil materials, replace with suitable soil materials.

3.05 EXCAVATION FOR STRUCTURES

A. The Contractor shall excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.10 foot. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb the bottom of the excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 0.10 foot. Do not disturb the bottom of excavations intended as bearing surfaces.

3.06 EXCAVATION FOR WALKS AND PAVEMENTS

A. The Contractor shall excavate surfaces under walks and pavements to indicated lines, cross-sections, elevations, and subgrades.

3.07 SUBGRADE INSPECTION

A. The Contractor shall notify the Engineer when excavations have reached the required subgrade.

B. If the Engineer determines that unsuitable soil is present, the Contractor shall continue excavation and replace with compacted backfill or fill material as directed.

C. The Contractor shall proof-roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll the subgrade in one direction**,** repeating proof-rolling in the direction perpendicular to the first direction. Limit vehicle speed to 3 miles per hour (mph).

2. Excavate soft spots, unsuitable soils, and areas of excessive pumping or rutting, as determined by the Engineer, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices or additional work.

E. As directed by the Engineer, the Contractor shall reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities without additional compensation.

3.08 UNAUTHORIZED EXCAVATION

A. The Contractor shall fill unauthorized excavation under foundations or wall footings by extending the bottom elevation of concrete foundation or footing to the excavation bottom without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2,500 psi, may be used when approved by the Engineer.

1. Fill unauthorized excavations under other construction or utility pipe as directed by the Engineer.

3.09 STORAGE OF SOIL MATERIALS

A. The Contractor shall stockpile excavated suitable soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water.

1. Stockpile soil materials away from edge of excavations. Do not store within the drip line of remaining trees.

3.10 BACKFILL

A. Backfill and compaction shall be according to the recommendations of the Geotechnical Report included as an Appendix to these Specifications.

B. The Contractor shall place and compact backfill in excavations promptly, but not before completing the following:

1. Constructing below finish grade, including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.

6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

C. The Contractor shall place backfill on subgrades free of mud.

3.11 SOIL FILL

A. The Contractor shall plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. The Contractor shall place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use suitable soil material.
2. Under walks and pavements, use suitable soil material.
3. Under building slabs, use engineered fill.
4. Under footings and foundations, use engineered fill.

C. The Contractor shall place soil fill on subgrades free of mud.

3.12 SOIL MOISTURE CONTROL

A. The Contractor shall uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compacting to within 2% of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy.
2. Remove and replace or scarify and air dry otherwise suitable soil material that exceeds optimum moisture content by 2% and is too wet to compact to the specified dry unit weight.

3.13 COMPACTION OF SOIL BACKFILLS AND FILLS

A. The Contractor shall place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. The Contractor shall place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. The Contractor shall compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D698:

1. Under structures, building slabs, steps, and pavements, scarify and recompact the top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95%.
2. Under walkways, scarify and recompact the top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92%.
3. Under lawn or unpaved areas, scarify and recompact the top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90%.
4. For utility trenches, compact each layer of initial and final backfill soil material at 85% in unpaved lawn areas. Final backfill compaction shall meet the requirement listed above depending on the location of the trench.

3.14 GRADING

A. General: The Contractor shall uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross-sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.15 FIELD QUALITY CONTROL

A. The number and location of the tests shall be as specified in these Specifications and as directed by the Engineer during construction.

B. The Contractor shall coordinate activity with the Engineer and the testing agency to permit testing as directed in the presence of the Engineer.

C. The cost of all testing to achieve specified requirements shall be borne by the Contractor. The Contractor shall be reimbursed by the Owner for passing field tests based on the Testing Allowance pay item listed in the Contract Documents.

D. The costs of any and all retests due to failure to achieve specified requirements shall be solely borne by the Contractor and are not reimbursable under this Contract.

E. All materials proposed for use shall be tested as follows:

Material	Required Test	Min No. Tests
Suitable Soil Materials	Soil Classification using ASTM D2487 (including all tests contained therein)	One per source of materials to determine conformance with materials specified herein; additional test whenever there is any apparent change.
	Soil moisture-density relationship using Modified Proctor ASTM D1557	One per source of material or apparent change in material.

F. The Contractor shall allow the testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after the test results for previously completed work comply with requirements.

G. Footing Subgrade: At footing subgrades, the testing agency will perform at least one test of each soil stratum to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Engineer.

H. The testing agency will test compaction of soils in place according to ASTM D1556/D1556M, ASTM D2167, ASTM D2937, and ASTM D6938 as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2,000 square feet or less of paved area or building slab, but in no case fewer than three tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for each 100 feet or less of wall length but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 400 feet or less of trench length but no fewer than two tests.

I. When the testing agency reports that subgrades, fills, or backfills have not achieved the degree of compaction specified, the Contractor shall scarify and moisten or aerate or remove and replace soil to the depth required and recompact and retest until specified compaction is obtained.

J. The approved testing agency shall transmit copies of field testing results as follows:

1. One copy to the Owner.
2. Two copies to the Engineer.
3. Two copies to the Contractor.

The field test reports shall include, at a minimum, project title; project location; location of sample(s) tested; time of testing; date of testing; testing person's full name; testing agency name, address, and telephone number; and test results.

K. No soil material shall be used until (1) the Engineer has reviewed and approved test reports and (2) the Contractor submits certification that the soil material proposed for construction is clean and meets gradation and other parameters specified in this Specification.

L. At no cost to the Owner, the Contractor shall remove and replace or correct all materials and work which tests indicate do not conform, in the opinion of the Engineer, to the requirements of these Specifications.

M. The results of in-place density tests shall be considered satisfactory if the density in each instance is equal to or greater than the specified density. Soil moisture content at the time of testing shall conform to requirements of these Specifications.

N. Where unsatisfactory compaction is revealed by the tests, the Contractor shall re-excavate, backfill, recompact, and/or rework the backfill as required to obtain the required degree of compaction over the entire depth of the excavation.

O. The testing agency shall transmit to the Engineer copies of all testing agency invoices submitted to the Contractor for payment. Invoices shall clearly indicate specific services and date and time services are rendered and shall indicate if the invoiced testing cost is an initial test of the Contractor's work or is a re-test required due to the Contractor's failure to initially achieve the specified requirements.

3.16 PROTECTION

A. Protecting Graded Areas: The Contractor shall protect newly graded areas from traffic and erosion and keep them free of trash and debris.

B. The Contractor shall repair and reestablish grades to the specified tolerances where completed or partially completed surfaces become eroded, rutted, settled,

or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by the Engineer and reshape and recompact.

C. Where settling occurs before the Project Correction Period elapses, The Contractor shall remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: The Contractor shall transport surplus suitable soil to designated storage areas on the Owner's property and stockpile and spread this soil as directed by the Engineer.

1. Remove waste material, including unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.

END OF SECTION

SECTION 02305
EARTHWORK FOR UTILITIES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall provide all materials, equipment, labor, and work necessary to completely construct the project in accordance with the Contract Documents. This work includes but is not limited to the following:

1. Backfilling trenches at the end of each working day or placement of steel plates over trenches after working hours. Steel plates shall be H-20 load rated.
2. Preparing trench foundations.
3. Providing suitable material for all trenches as specified and as required.
4. Obtaining, storing, maintaining, and disposing of materials.
5. Dewatering, shoring, and sheeting.
6. Placing, compacting, testing, final grading, and subgrade demolition.
7. Performing all other work required by the Contract Documents.

B. The Contractor is responsible for performing all work so as not to damage existing roadways, facilities, utilities, structures, etc. and shall repair and replace such damage to equal or better than its original undamaged condition without cost to the Owner.

C. The Contractor shall examine the site before submitting a bid, taking into consideration all conditions that may affect the work.

D. The Contractor shall coordinate all additional subsurface investigations and testing included with this work with the Engineer before performing the excavation and foundation preparation work. In general, if the Contractor finds different and unsuitable/unsatisfactory soil conditions during the work, the Contractor shall notify the Engineer and the Owner immediately.

1.02 SUBMITTALS

The Contractor shall submit the following shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D2487 of each onsite and borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D1557 for each onsite and borrow soil material proposed for fill and backfill.

B. The Contractor shall submit records before the start of this work. The Contractor shall verify that the existing conditions are correct as shown on the plans and mentioned in these Specifications. The Contractor shall note any discrepancies found immediately and notify the Owner and Engineer. The records shall include the following:

1. Location of all existing underground utilities, structures, etc. surrounding the areas to be excavated that may be impacted by the work.
2. Location of test excavations.
3. Location of inspections.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply:

A. American Society for Testing and Materials (ASTM)

1. ASTM D1556/D1556M—Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
2. ASTM D1557—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
3. ASTM D2487—Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
4. ASTM D2937—Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
5. ASTM D3282—Standard Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.

6. ASTM D3740—Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used In Engineering Design and Construction.
7. ASTM D6938—Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
8. ASTM E329—Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

B. Florida Statutes (FL)

1. Florida Trench Safety Act (90-96, Laws of Florida).

C. Occupational Safety and Health Administration (OSHA)

1. 29 CFR 1926, Subpart P—Safety and Health Regulations for Construction, Excavations.
2. OSHA 2226—Trenching and Excavation Safety.

1.04 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E329 to conduct soil materials and definition testing, as documented according to ASTM D3740.

B. The Contractor shall do the following:

1. Ensure that excavations provide adequate working space and clearance for the work to be performed and for installing piping and buried utilities. In no case shall excavation faces be undercut.
2. Ensure that foundation surfaces are clean and free of loose material of any kind when pipelines and buried utilities are placed on them.
3. Perform excavating, trenching, and backfilling in compliance with applicable requirements of governing authorities having jurisdiction.
4. Ensure that shoring and sheeting for excavations are designed by a Florida-registered Professional Engineer and are in accordance with the OSHA 2226.
5. Before beginning any excavation or grading, ensure the accuracy of all survey data indicated on the Contract Drawings and in these Specifications and/or as provided. If the Contractor discovers any inaccuracies, errors, or omissions in the survey data, the Contractor shall immediately notify the Owner so that proper adjustments can be anticipated or ordered. If the Contractor begins any excavation or grading, this shall be considered an acceptance of the survey data by the Contractor, after which time the

Contractor has no claim against the Owner resulting from alleged errors, omissions, or inaccuracies of the survey data.

6. Ensure that tolerances for excavation are ±0.10 foot to the required line and to the required grade. Tolerance for compaction of in-place material shall be ±0.10 foot to the required grade.
7. Ensure that all trench materials derived from the project site and imported to this site are examined, tested, and classified by an Engineer-approved soils testing laboratory.
8. Remove unsuitable materials and unsuitable materials including muck, silts, peat, and other loose and very loose compressible soils from excavations before placing pipe foundation, bedding, and buried utilities.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 PROJECT CONDITIONS

A. Existing Utilities: The Contractor shall not interrupt utilities serving facilities occupied by the Owner or others unless permitted to do so in writing by the Engineer and then only after arranging to provide temporary utility services according to the requirements indicated.

1. Notify the Engineer not less than 2 days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without the Engineer’s written permission.
3. Contact a utility-locator service and obtain utility locations for the Project Area before excavating.

B. The Contractor shall demolish and completely remove from the site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

1.08 DEFINITIONS

A. *Backfill*: Soil material or controlled low-strength material used to fill an excavation.

1. *Initial Backfill*: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. *Final Backfill*: Backfill placed over initial backfill to fill a trench.

B. *Base Course*: The course placed between the subbase course and hot-mix asphalt paving.

C. *Bedding Course*: The course placed over the excavated subgrade in a trench before laying pipe.

D. *Borrow Soil*: Suitable soil imported from off site for use as fill or backfill.

E. *Drainage Course*: The course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. *Excavation*: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. *Authorized Additional Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Engineer. Authorized additional excavation and replacement material will be paid for according to the Contract provisions for unit prices.
2. *Bulk Excavation*: Excavation more than 10 feet in width and more than 30 feet in length.
3. *Unauthorized Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be without additional compensation.

G. *Fill*: Soil materials used to raise existing grades.

H. *Structures*: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. *Subgrade*: The surface or elevation remaining after completing excavation, or the top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

J. *Utilities*: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.09 TESTING REQUIREMENTS

A. The Contractor shall furnish a soil survey for suitable material and samples of materials.

B. Testing for source material, for classification, and for prequalification of material (on or off site) shall be performed by an independent testing agency retained by the Contractor and approved by the Engineer.

C. Testing for in-place compacted fill shall be performed by the same independent testing agency as approved by the Engineer and retained by the Contractor.

D. The number and location of the tests shall be as specified in these Specifications and as directed by the Engineer during construction.

E. The Contractor shall coordinate activity with the Engineer and the testing agency to permit testing as directed in the presence of the Engineer.

F. The cost of all testing to achieve specified requirements shall be borne by the Contractor. The Contractor shall be reimbursed by the Owner for passing field tests.

G. The costs of any and all retests due to failure to achieve specified requirements shall be solely borne by the Contractor and are not reimbursable under this contract.

H. All materials proposed for use shall be tested as follows:

Material	Required Test	Min. No. Tests
Suitable Soil Materials	Soil Classification using ASTM D2487 (including all tests contained therein)	One per source of materials to determine conformance with materials specified this Specification; additional test whenever there is any apparent change.
	Soil moisture-density relationship using Modified Proctor ASTM D1557	One per source of material or apparent change in material.

I. Soil materials shall be tested during construction as follows:

Material	Required Test	Min. No. Tests
Suitable Soil Material in-place after compaction	Field Density ASTM D1556/1556M – Sand Cone Method, or ASTM D6938 – Nuclear Density Method, or ASTM D2937 – Drive Cylinder Method	For each layer of trench bottom subgrade before addition of soil materials, refill, bedding, and backfill, and for each 400 lineal feet of trench or fraction thereof, whichever is greater; two tests for each drainage, manhole, or wet well structure; additional test whenever there is any change in native soil, groundwater, or soil moisture conditions.

J. The approved testing agency shall transmit copies of required laboratory test results as follows:

1. One copy to the Owner.
2. Two copies to the Engineer.
3. Two copies to the Contractor.

The laboratory test reports shall include, at a minimum, project title; project location; location of sample; source, time, and date of testing; testing agency's name, address, and telephone number; and test results. Each test report shall be signed and sealed by the Professional Engineer representing the testing agency as specified in these Specifications.

K. The approved testing agency shall transmit copies of field testing results as follows:

1. One copy to the Owner.
2. Two copies to the Engineer.
3. Two copies to the Contractor.

The field test reports shall include, at a minimum, project title; project location; location of sample(s) tested; time of testing; date of testing; testing person's full name; testing agency name, address, and telephone number; and test results.

L. No soil material shall be used until 1) the Engineer has reviewed and approved test reports and 2) the Contractor submits certification that the soil material proposed for construction is clean and meets gradation and other parameters in these Specifications.

M. At no cost to the Owner, the Contractor shall remove and replace or correct all materials and work which tests indicate do not conform, in the opinion of the Engineer, to the requirements of these Specifications.

N. The results of in-place density tests shall be considered satisfactory if the density in each instance is equal to or greater than the specified density. Soil moisture content at the time of testing shall conform to requirements of these Specifications.

O. Where the tests reveal unsatisfactory compaction, the Contractor shall re-excavate, backfill, recompact, and/or rework the backfill as required to obtain the required degree of compaction over the entire depth of the excavation.

P. The testing agency shall transmit to the Engineer copies of all testing agency invoices submitted to the Contractor for payment. Invoices shall clearly indicate specific services and date and time services are rendered and shall indicate if the invoiced testing cost is an initial test of the Contractor's work or is a re-test required due to the Contractor's failure to initially achieve the specified requirements.

PART 2 PRODUCTS

2.01 STRUCTURAL MATERIALS

A. Materials used for shoring and bracing, such as sheet piling, uprights, stringers, and crossbraces, shall be in good serviceable condition. Any timber used shall be sound and free from large or loose knots.

B. Pressure-treated timber shall be used where wood sheeting or piling is specified or indicated to be cut and left in place.

2.02 TRENCH SOIL MATERIALS

A. Materials used for trench construction shall be free of clumps of clay, rock or gravel, debris, waste, frozen materials, and other deleterious matter as determined by the Engineer and shall be suitable soil materials as follows:

Area Classification	Soil Materials
In excavations and trenches	Excavated and borrow material that has been sampled, tested, and approved as "Suitable Soil Material."

B. Suitable Soil Materials

1. Soil Classification Groups: Suitable soil materials for each trench shall be as follows:

Suitable Soil Material (ASTM D487, Soil Classification Groups)		
In-situ Foundation	Bedding, Haunching, and Initial Backfill	Final Backfill
SW SP	SW SP	SW SP

2. Maximum Particle Size Limitations for Suitable Soil Materials: The maximum allowable particle size for suitable soil materials within each trench for each type of utility shall be as follows:

Conduit	Maximum Allowable Particle Size		
	In-situ Foundation	Bedding, Haunching, and Initial Backfill	Final Backfill
Plastic Pipe (PVC, CPVC, HDPE, etc.) less than 6-inch-diameter	See Note 1	1/2 inch	3 inches
Plastic Pipe (PVC, CPVC, HDPE, etc.) 6-inch-diameter and Larger	See Note 1	3/4 inch	3 inches
Concrete Pipe			
Steel Pipe			
Ductile Iron Pipe			
Fiberglass Pipe	See Note 1	3/4 inch or three times the wall thickness, whichever is less	3 inches
Other Conduit Materials	See Note 2	See Note 2	See Note 2

(1) There is no requirement when suitable undisturbed native soil material is used. Disturbed portions of the foundation and/or unsuitable native soil material shall be replaced with suitable soil materials meeting all the requirements for Bedding.
(2) The maximum allowable particle size shall be in accordance with the manufacturer's written recommendation.

3. Additional Requirements of Suitable Materials: Suitable soil materials shall be free of debris, waste, frozen materials, vegetation, or other deleterious matter. Soils within 4 inches of the exterior surface of the pipe shall be free of gravel, stones, or other materials which may abrade the pipe surface.

C. Unsuitable Materials

1. Unsuitable soil material shall mean ASTM D2487, Soil Classification Groups GW, GP, GM, GC, SC, CL, ML, OL, CH, MH, OH, PT, and other

highly organic soils and soil materials of any classification that have a moisture content at the time of compaction beyond the range of 1 percentage point below and 3 percentage points above the optimum moisture content of the soil material as determined by moisture-density relations test.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

The Contractor shall do the following:

A. Carefully verify by hand methods the location of all surrounding underground utilities before performing utility excavations and trenches.

B. Protect utilities to be left in place from damage.

C. Do not interrupt existing utilities serving facilities occupied and used by the Owner, except when permitted in writing by the Owner.

D. Protect benchmarks, survey points, and existing structures, roads, sidewalks, monitoring wells, paving, curbs, etc. against damage from equipment, vehicular or foot traffic, settlement, lateral movement, undermining, washout, and all construction-related activities.

E. Repair and replace damage to existing facilities to equal or better than their original undamaged condition without cost to the Owner and to the approval of the Engineer.

F. Excavate and trench in ways that will prevent surface water and subsurface water from flowing into excavations and will also prevent flooding of the site and surrounding area.

G. Protect excavations and trenching by shoring, bracing, sheet piling, underpinning, or other methods as required to prevent cave-ins or loose dirt from falling into excavations and trenches.

H. Do not operate earth-moving equipment within 5 feet of walls of concrete structures for depositing or compacting backfill material.

I. Compact the backfill material placed next to concrete walls with hand-operated tampers or similar equipment that will not damage the structure.

J. Excavate, fill, backfill, and grade to elevations required by the Contract Documents.

K. Pile excavated materials suitable for backfill in an orderly manner a sufficient distance from excavations to prevent overloading, slides, and cave-ins.

L. Do not obstruct access ways, roadways, and plant facilities.

M. Dewater excavations and trenches in accordance with Section 02240, Dewatering.

N. Refer to the Contract Drawings for additional requirements related to earthwork and protection of existing features.

3.02 TRENCH EXCAVATION

A. Before excavating the trench, the Contractor shall prepare the surface, including clearing and grubbing as specified in Section 02230, Site Preparation.

B. The Contractor shall be required to fully comply with all applicable OSHA Excavation Safety Standards and to abide by them as covered by the most current version of the Florida Trench Safety Act (90-96, Laws of Florida).

C. The Contractor shall ensure that mechanical equipment used for trench excavation shall be of a type, design, and construction and shall be so operated that conduit/ utility, when accurately laid to specified alignment, will be centered in the trench with adequate clearance between the conduit/utility and sidewalls of the trench. Undercutting the trench sidewall to obtain clearance will not be permitted.

D. The Contractor shall not use mechanical equipment in locations where its operation would cause damage to trees, buildings, culverts, other existing property, utilities, structures, etc. above or below ground. In all such locations, the Contractor shall use hand excavating methods.

E. The Contractor shall not use blasting.

F. The Contractor shall cut trenches sufficiently wide to enable proper installation of services and to allow for testing and inspection. The Contractor shall also trim and shape trench bottoms and leave them free of irregularities, lumps, and projections. Trench width shall be excavated as specified on the Contract Drawings.

G. The Contractor shall construct trench walls so as to avoid side wall collapse or sloughing. Trenches shall be either braced or open construction in accordance with the Contract Documents. No separate payment will be made for any special procedure used in connection with the excavation.

H. Where sheeting and bracing are not required, the Contractor shall construct trench walls in the bottom of the excavation as vertical as possible to the maximum height allowable by OSHA. Trench walls above this height shall be sloped to guard against side wall collapse or sloughing as specified on the Contract Drawings.

I. Where sheeting and bracing are required, the sheeting and bracing system shall meet the requirements specified in these Specifications.

J. Excavations shall be to the design elevations shown on the Contract Drawings or as specified, unless unsatisfactory or unsuitable foundation materials are encountered in the bottom of the excavation. Where unsatisfactory or unsuitable foundation materials are encountered, this material shall be undercut and removed as indicated on the Contract Drawings and replaced with suitable soil material meeting all the requirements for Bedding. The lift thicknesses and compaction requirements for the replacement soil shall also meet the requirements for Bedding.

K. The Contractor shall be careful not to overexcavate except where necessary to remove unsatisfactory or unsuitable materials, irregularities, lumps, rock, and projections. Unnecessary overexcavation shall be replaced as specified in these Specifications at the Contractor's sole expense.

L. The Contractor shall accurately grade bedding soil materials at the bottoms of the trenches to provide uniform bearing and support for each section of conduit/utility at every point along its entire length except where it is necessary to excavate the bedding for conduit/utility bells (e.g., pipe bells), etc. or for proper sealing of conduit/utility joints. Abrupt changes in grade of the trench bottom shall be avoided.

M. The Contractor shall dig bell holes and depressions after the bedding has been graded to ensure that the conduit/utility rests on the prepared bedding for as much of its full length as practicable. Bell holes and depressions shall be only of such length, depth, and width as required to make the joint.

N. The Contractor shall do the following:

1. Pile all excavated material in a manner that will not endanger the work or erode the stormwater management facilities or water courses.
2. Avoid obstructing sidewalks, driveways, and plant facilities.
3. Leave hydrants, valve pit covers, valve boxes, or other utility controls unobstructed and accessible.

4. Keep gutters, drainage inlets, natural water courses, and miscellaneous drainage structures clear or make other satisfactory provisions for their proper operation.

O. The Contractor shall keep all suitable materials that are suitable for use/reuse in the trench construction separated from unsuitable materials.

P. Except where otherwise authorized, indicated, or specified, the Contractor shall replace, at the Contractor's own expense, all materials excavated below the bottom of concrete walls, footings, slabs on grade, and foundations with concrete or flowable fill, as directed by the Engineer.

Q. The Contractor shall adhere to these Additional Excavation Requirements for piping:

1. Excavate trenches so that the piping can be laid to the lines, grades, and elevations indicated on the Contract Drawings.

2. For piping designated to be laid to a minimum cover requirement, grade trenches to avoid high and low points to the extent practical. Record Drawings of such pipes shall present top-of-pipe and grade elevations at all high and low points along each pipe segment, at the end points of each pipe segments, and at intervals not to exceed 100 feet along each pipe segment. If, in the opinion of the Engineer, additional air release and/or vacuum relief valves are required, the Contractor shall install the additional items as directed by the Engineer.

3. Except at locations specifically indicated otherwise on the Contract Drawings, the required minimum cover over the top of the pipe from finished grade for various pipe diameters shall be as follows:

	Pipe Diameter			
	48 inch or less	66 inch	72 inch	96 inch
Minimum Cover	3 feet	4 feet	4.5 feet	5 feet

Continue dewatering operations along each pipe segment until the required minimum cover is provided. During the dewatering operations, the groundwater level in the trench shall remain at all times a minimum of 1 foot below bottom of trench excavations.

R. The Contractor shall adhere to these Additional Excavation Requirements for Electrical Utilities:

1. Avoid abrupt changes in grade of the trench bottom.

2. The required minimum cover over the top of electrical conduits from finished grade shall be as follows:

	Electrical Conduits (Lines less than 5 kV)	Electrical Conduits (Lines 5 kV and up)
Minimum Cover	2 feet	3 feet

3. The required minimum clearance from the bottom of mat foundations and/or footings shall be 2 feet. Provide additional cover where necessary to satisfy the minimum clearance requirement.

4. Provide additional cover depth if necessary to avoid interference of other cables, ducts, piping, structures, and other utilities.

S. The Contractor shall adhere to this Additional Excavation Requirement for Appurtenances:

1. Ensure that excavations for valves and similar appurtenances shall be sufficient to leave at least 12 inches in the clear between the outer surfaces and the embankment or timber used to hold and protect the walls.

3.03 PROTECTION OF PERSONS AND PROPERTY

A. The Contractor shall do the following:

1. Barricade and post excavations with warning signs for the safety of persons. Provide warning lights during hours of darkness.
2. Protect structures, utilities, sidewalks, pavements, and other facilities immediately adjacent to excavations against damage, including loading, settlement, lateral movement, undermining, and washout.

B. Conduct topsoil removal operations to ensure the safety of persons and to prevent damage to existing structures and utilities, construction in progress, trees and vegetation to remain standing, and other property.

3.04 SHEETING AND BRACING

A. Where sheeting and bracing are required to support the side walls of the excavation, the Contractor shall retain a Professional Engineer, registered in Florida, to design sheeting and bracing. The design shall establish requirements for sheeting and bracing and shall comply with all applicable codes; authorities having jurisdiction; and federal, state, and local regulations.

B. The sole responsibility for the design, methods of installation, and adequacy of sheeting and bracing shall be and shall remain that of the Contractor and the Contractor's Professional Engineer. The Contractor shall provide all necessary sheeting and bracing or other procedures as required to ensure safe working conditions and to protect the excavations.

C. Sheeting and bracing shall consist of braced steel sheet piling, trench box, braced wood lagging, and soldier beams or other approved methods.

D. The Contractor shall immediately fill and compact voids formed outside the sheeting. Where soil cannot be properly compacted to fill the void, the Contractor shall use Class B concrete as backfill at no additional cost to the Owner.

E. The Contractor shall install sheeting outside the required clearances and dimensions. Sheeting shall be plumb, securely braced, and tied in position. Sheeting shall be adequate to withstand all pressure to which it may be subjected. The Contractor shall correct any movement or bulging at no expense to the Owner so as to provide the necessary clearances and dimensions.

F. The Contractor shall maintain sheeting and bracing in excavations and trenches for the entire time excavations will be open.

G. The Contractor shall not brace sheeting against pipe being laid. Sheeting shall be braced so that no concentrated load of horizontal thrust is transmitted to the pipe.

3.05 DEWATERING, WATER REMOVAL, AND DRAINAGE MAINTENANCE

A. Water shall not be permitted to accumulate in excavations. The Contractor shall provide dewatering systems to convey water away from excavations so that softening of foundations bottoms, footing undercutting, and soil changes detrimental to subgrade stability and foundation will not occur. Dewatering systems and methods of disposal shall be as specified in Section 02240, Dewatering, and as approved by the Engineer before being installed by the Contractor. Groundwater levels shall be maintained a minimum of 1 foot below bottom of trenches or excavations.

B. Dewatering systems and equipment shall be in place as required to eliminate water during the excavation period until the work is completed. The Contractor shall provide ample means and equipment with which to remove promptly and dispose of properly all water entering any excavation. This includes the use of sand or gravel as required to maintain adequate flow during the pipe laying or installation of other items of work within the excavation.

C. The Contractor shall dispose of water pumped or drained in a suitable manner without damage to adjacent property, to other work under construction, or to roads. Water shall not be discharged onto surface improvements without adequate protection of the surface at the point of discharge. All gutter, drains, culverts, sewers, and inlets shall be kept clean and open for surface drainage. Water shall not be directed across or over pavements except through approved pipes or properly constructed troughs. The Contractor shall obtain permission from the Owner of any property involved before constructing water courses or installing discharge pipe or hose for removal of water and provide for disposal of the water without ponding or creating a public nuisance.

D. All pumps used for dewatering shall have noise-reduction features and shall be able to run continuously with minimal attendance. If required by the Owner or Engineer, the pumps shall be enclosed on all sides with a plywood enclosure with padded material suitable for outdoor conditions on the inside of the enclosure to further reduce pump engine noise to an acceptable level. All applicable ordinances and codes for noise abatement shall be followed. The Contractor shall maintain pumps at all times, as necessary. When pumps are no longer required, the Contractor shall remove the pumps, wellpoints, pipes, and other apparatus from the area.

E. It is essential that the discharge of the trench dewatering pumps be conducted to natural drainage channels, drains, or storm sewers.

F. Trenches shall be constructed on the upstream side of the traffic way across roadways, driveways, or other traffic ways adjacent to drainage ditches or water to prevent impounding water after the pipe has been laid. The Contractor shall construct and maintain bridges and other temporary structures required to maintain traffic across such unfilled trenches. Backfilling shall be done so that water will not accumulate in unfilled or partially filled trenches. After backfilling is completed, the Contractor shall immediately remove all material deposited in roadway ditches or other water courses crossed by the line of trench and restore the original section, grades, and contours of ditches or water courses. Surface drainage shall not be obstructed longer than necessary.

G. Where trenches are constructed in ditches or other water courses, backfill shall be protected from surface erosion. Where the grade of the ditch exceeds 1%, the Contractor shall install ditch checks. Unless otherwise indicated on the Contract Drawings, ditch checks shall be concrete or as otherwise approved by the Engineer. Ditch checks shall extend not less than 2 feet below the original ditch or water course bottom for the full bottom width and at least 18 inches into the side slopes and shall be at least 12 inches thick.

3.06 BACKFILLING AND COMPACTION

A. Backfill and compaction shall be according to the recommendations of the Geotechnical Report provided as an Appendix to these Specifications.

B. The Contractor shall not backfill trenches until required tests are performed.

C. Trenches improperly backfilled shall be reopened to the depth required for proper compaction, then refilled and compacted as specified, or the condition shall be otherwise corrected as directed.

D. The Contractor shall perform the following steps to ensure compaction at the bottom of the trench or excavation before bedding:

1. Remove disturbed native soil material and/or any soils not meeting the requirement of suitable soil material as indicated on the Contract Drawings.
2. Compact the bottom of the trench excavation (undisturbed native subsurface soil) to no less than 95% of the Modified Proctor maximum dry density in accordance with ASTM D1557, before placement of foundation, bedding, piping, and backfill.

E. To backfill below and around pipe to the spring line of the pipe, the Contractor shall do the following:

1. Construct foundation and bedding as indicated on the Contract Drawings before placement of pipe.
2. Install each pipe at proper grade, alignment, and final position.
3. Deposit suitable soil material uniformly and simultaneously on each side of pipe in completed course layers to prevent lateral displacement.
4. Compact under pipe haunches and on each side of pipe to the pipe spring line as shown on the Contract Drawings to hold the pipe in the proper position during subsequent pipe backfilling and compaction operations.
5. Construct haunching as indicated on the Contract Drawings.

F. To trench backfill above pipe spring line to finished grade, the Contractor shall do the following:

1. Deposit suitable soil material around and above pipe in uniform layers as shown on the Contract Drawings.
2. Backfill and compact trenches from the spring line of the pipe to the top of the trench in completed course layers as shown on the Contract Drawings.

3. Use material previously defined in these Specifications as suitable soil material.
4. Compact by hand or mechanical tampers.

3.07 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. The Contractor shall remove and legally dispose of waste materials, including excavated material classified as unsuitable soil material, trash, and debris from the property at no additional cost to the Owner.

END OF SECTION

SECTION 02370
EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall take every reasonable precaution throughout construction to prevent the erosion of soil and the sedimentation of streams, bays, storm systems, or other water impoundments, ground surfaces, or other property as required by federal, state, and local regulations.

B. The Contractor shall provide protective covering for disturbed areas upon suspension or completion of land-disturbing activities. Permanent vegetation shall be established at the earliest practicable time. Temporary and permanent erosion-control measures shall be coordinated to ensure economical, effective, and continuous erosion and siltation control throughout the construction and post-construction period.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Department of Transportation (FDOT)

1. FDOT Section 103—Temporary Work Structures.
2. FDOT Section 104—Prevention, Control, and Abatement of Erosion and Water Pollution.
3. FDOT Section 530—Revetment Systems.
4. FDOT Section 982—Fertilizer.
5. FDOT Section 985—Geosynthetic Materials.

1.04 REGULATORY REQUIREMENTS

A. The Contractor shall prevent damage to properties outside the construction limits from siltation due to construction of the project and assume all responsibilities to the affected property owners for correction of damages which may occur. Erosion-control measures shall be performed conforming to the requirements of and in accordance with plans approved by applicable state and local agencies and as specified by the erosion-control portion shown on the Drawings and as required by these Specifications. The Contractor shall not allow mud and debris to accumulate in the streets or enter drainage ditches, canals, or waterways. Should the Contractor pump water from excavations during construction, appropriate siltation preventative measures shall be taken before the pumped water is discharged into any drainage ditch, canal, or waterway.

1.05 PRACTICES

The Contractor shall adhere to the following:

A. Avoid dumping soil or sediment into any stream bed, pond, ditch, or watercourse.

B. Maintain an undisturbed vegetative buffer where possible between a natural watercourse and trenching and grading operations.

C. Avoid equipment crossings of streams, creeks, and ditches where practicable.

1.06 EROSION AND SEDIMENT-CONTROL DEVICES AND FEATURES

A. The Contractor shall construct all devices (silt fences, retention areas, etc.) for sediment control at the locations required to protect federal, state, and local water bodies and water courses and drainage systems before beginning to excavate the site. All devices shall be properly maintained in place until a structure or paving makes the device unnecessary or until directed to permanently remove the device.

B. The Contractor shall use mulch to temporarily stabilize areas subject to excessive erosion and to protect seed beds after planting where required.

C. Filter fabric, hay bales, or other approved methods shall be placed and secured over the grates of each existing inlet, grating, or storm pipe opening near the area of excavation to prevent silt and debris from entering the storm systems.

D. The Contractor shall use silt fences, hay bales, and floating turbidity barriers as shown on the plans or as directed by the Owner or Owner’s Representative to restrict movement of sediment from the site.

E. The Contractor shall establish vegetative cover on all unpaved areas disturbed by the work.

PART 2 PRODUCTS

2.01 GENERAL

A. Open-mesh biodegradable mulching cloth.

B. Fertilizer shall be 10-10-10 grade or equivalent.

C. Lime shall be Dolomitic Agricultural Ground limestone, in accordance with FDOT Section 982.

D. Grass shall be in accordance with Section 02920, Seeding and Sodding.

E. Silt fence shall consist of non-biodegradable filter fabric (Trevira, Mirafi, etc.), in accordance with FDOT Section 985, wired to galvanized wire mesh fencing and supported by wood or metal posts.

F. Floating or staked turbidity barriers as specified in FDOT Section 985 and FDOT Section 104.

G. Erosion Stone: FDOT Section 530.

1. Sand-Cement Riprap.
2. Concrete Block.
3. Rubble 20 to 300 pounds each.

H. Filter Fabric for placing under Riprap shall meet the requirements of FDOT Section 985.

I. Baled hay or straw in accordance with FDOT Section 104.

PART 3 EXECUTION

3.01 CLEARING

A. The Contractor shall schedule and perform clearing and grubbing so that subsequent grading operation and erosion-control practices can follow immediately after. Excavation, borrow, and embankment operations will be conducted as a continuous operation. All construction areas not otherwise protected shall be planted with permanent vegetative cover within 30 working days after completing active construction.

3.02 STABILIZING

A. The angle for graded slopes and fills shall be no greater than the angle that can be retained by vegetative cover or other adequate erosion-control devices or structures. All disturbed areas outside of embankment left exposed will, within 30 working days of completion of any phase of grading, be planted or otherwise provided with either temporary or permanent ground cover, devices, or structures sufficient to restrain erosion.

3.03 REGULATORY REQUIREMENTS

A. Whenever land-disturbing activity is undertaken on a tract, a ground cover sufficient to restrain erosion must be planted or otherwise provided within 30 working days on that portion of the tract upon which further active construction is to be undertaken.

B. If any earthwork is to be suspended for any reason for longer than 30 calendar days, the areas involved shall be seeded with vegetative cover or otherwise protected against excessive erosion during the suspension period. Suspension of work in any area of operation does not relieve the Contractor of the responsibility to control erosion in that area.

3.04 VEGETATIVE COVER

A. Preparation of Seedbed. Areas to be seeded shall be scarified a depth of 4 inches until a firm, well-pulverized, uniform seedbed is prepared. Fertilizer shall be applied during the scarification process in accordance with the following rates:

1. Fertilizer—10 to 15 pounds per 1,000 square feet.

B. Seeding. Disturbed areas along embankments shall be permanently seeded with mix specified in Section 02920, Seeding and Sodding.

C. The Contractor shall mulch all areas immediately after seeding. Mulch shall be applied and anchored as specified previously in this Section.

3.05 MAINTENANCE

A. The Contractor shall maintain all temporary and permanent erosion-control measures in functioning order. Temporary structures shall be maintained until such time as vegetation is firmly established and grassed areas shall be maintained until completion of the project. Areas which fail to show a suitable stand of grass or which are damaged by erosion shall be immediately repaired. No additional

payment will be made to the Contractor for re-establishing erosion-control devices, which may become damaged, destroyed, or otherwise rendered unsuitable for their intended function during the construction of the project.

B. The Contractor shall remove all silt, sediment, and debris buildup regularly to maintain functioning storm systems and erosion-control devices.

3.06 REMOVAL OF SEDIMENT CONTROL DEVICES

A. Near completion of the project, when directed by the Engineer, the Contractor shall dismantle and remove the temporary devices used for sediment control during construction. All erosion-control devices in seeded areas shall be left in place until the grass is established. The Contractor shall seed areas around devices and mulch after removing or filling temporary control devices.

B. The Contractor shall clean up all areas at the completion of the project.

END OF SECTION

SECTION 02700
EARTHWORK, PAVING, AND MARKINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to provide for the construction of all pavement and work related to roadways where indicated on the Drawings.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Limerock material submittal is to be made to include liquid limit, plastic index, gradation, certification regarding deleterious material, limerock bearing ratio (LBR), Florida Department of Transportation (FDOT) pit number, and other information as required to indicate performance in accordance with the specifications.

B. Information regarding asphaltic concrete materials and mix shall be submitted as required by the referenced FDOT specifications.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time, unless otherwise noted. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section.

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this Contract.
2. The Contractor shall retain an independent testing agency, as approved by the Engineer, to perform all tests, including tests referenced to be performed by the Engineer.
3. Payment for this project is in accordance with the Bid Form.

B. American Society of Testing and Materials (ASTM)

1. ASTM D1556/D1556M—Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
2. ASTM D1557—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).
3. ASTM D2167—Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
4. ASTM D6938—Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.04 QUALITY ASSURANCE

A. The Contractor shall perform field-density tests along the centerline of construction or as directed by the Engineer and in accordance with the FDOT's *Standard Specifications for Road and Bridge Construction*, latest edition, FDOT Standard.

B. The Contractor shall field check the depth of stabilization and/or limerock at each road crossing with a pipeline.

C. The Engineer may require additional testing as deemed necessary. The Engineer shall interpret test results and the Contractor shall perform remedial work as directed by the Engineer. The Contractor shall provide labor to the Engineer for help in performing tests and/or checking line and grade at no additional cost to the Owner.

D. Laboratory maximum dry density of soil mixtures at optimum moisture shall be determined by ASTM D1557 for subgrade, stabilized subgrade, and limerock base course.

E. Field density of stabilized subgrade and soils or soil mixtures in fill or backfill shall be determined by ASTM D1556/D1556M, D2167, or D6938 for limerock base course.

F. Bearing value of stabilized subgrade shall be determined by the methods required for determining limerock bearing ratio (LBR) according to the FDOT, Standard Specification FM 5-515.

G. Field density of stabilized subbase shall be 98% or greater of the Modified Proctor maximum dry density, ASTM D1557.

H. Field density of limerock base course shall be 98% or greater of the Modified Proctor maximum dry density, ASTM D1557.

I. The Engineer shall have sole responsibility for interpreting all test results. The Contractor shall bear the cost of all retests due to failure to achieve specified requirements.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING (NOT USED)

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS

2.01 GENERAL (NOT USED)

2.02 ROCK BASE

A. The following sections of the Standard Specifications shall apply:

1. Section 200-1, Description.
2. Section 200-2, Materials.

2.03 STABILIZING MATERIALS

A. The following sections of the Standard Specifications shall apply:

1. Section 160-1, Description.
2. Section 160-2, Materials.

2.04 PRIME AND TACK COATS FOR BASE COURSES

A. The following sections of the Standard Specifications shall apply:

1. Section 300-1, Description.
2. Section 300-2, Materials.

2.05 ASPHALT

A. The following sections of the Standard Specifications shall apply:

1. Superpave Asphalt Concrete:

a. Section 334-1, Description.
b. Section 334-2, Materials.
c. Section 334-3, General Composition of Mixture.
d. Section 334-5, Acceptance of the Mixture.

2. Asphalt Concrete Friction Courses:

a. Section 337-1, Description.
b. Section 337-2, Materials.
c. Section 337-3, General Composition of Mixes.
d. Section 337-4, Mix Design.
e. Section 337-6, Acceptance of the Mixture.

2.06 RAISED RETROREFLECTIVE PAVEMENT MARKERS

A. The following sections of the Standard Specifications shall apply:

1. Section 706-1, Description.
2. Section 706-2, Materials.

2.07 TRAFFIC STRIPES AND MARKINGS

A. The following sections of the Standard Specifications shall apply:

1. Painted Pavement Markings:

a. Section 710-1, Description.
b. Section 710-2, Materials.

2. Thermoplastic Pavement Markings:

a. Section 711-1, Description.
b. Section 711-2, Materials.

PART 3 EXECUTION

3.01 EXCAVATION AND EMBANKMENT

A. The following sections of the Standard Specifications shall apply:

1. Section 120-1, Description.
2. Section 120-2, Classifications of Excavation.
3. Section 120-3, Preliminary Soils Investigation.
4. Section 120-4, Removal of Unsuitable Materials and Existing Roads.
5. Section 120-5, Disposal of Surplus and Unsuitable Material.
6. Section 120-6.1, Materials for Borrow.
7. Section 120-7, Materials for Embankment.
8. Section 120-8, Embankment Construction.
9. Section 120-9, Compaction Requirements.
10. Section 120-10, Acceptance Program.
11. Section 120-11, Maintenance and Protection of Work.
12. Section 120-12, Construction.

B. Exceptions

1. Section 120-4.1, Subsoil Excavation: Unsuitable soils shall be those in Classifications A-6, A-7, or A-8 in the American Association of State Highway and Transportation Officials (AASHTO) System.
2. Section 120-4.2, Construction Over Existing Old Road: Where removal of existing pavement is called for, it shall be removed to the full depth as indicated in the cross-sections and replaced with new limerock and paving or other treatment in accordance with the Drawings and details.
3. Section 120-5.2, Disposal of Muck on Side Slopes: Disposing of muck on side slopes shall not apply.
4. Section 120-9.2.1, General: Laboratory maximum dry density shall be determined by Modified Proctor, ASTM D1557. Field densities shall be determined by ASTM D1556/D1556M, D2167, or D6938. All embankments shall be compacted to not less than 95% of the maximum dry density, as determined by modified Proctor, ASTM D1557.
5. Section 120-12.1, Construction Tolerances: No tolerance greater than 0.1-foot above or below the plan cross-section will be allowed.

3.02 STABILIZING

A. The following sections of the Standard Specifications shall apply:

1. Section 160-3, Construction Methods.
2. Section 160-4, Acceptance Program.

B. Exceptions

1. Section 160-2.4, Granular Subbase: The Contractor may not substitute 6 inches of Granular Subbase for 12 inches of Stabilization unless such substitution is specifically indicated on the Drawings.
2. Section 160-4.2.1.2, Undertolerance in Bearing Value Requirements: no undertolerance will be acceptable.

3.03 LIMEROCK BEARING RATIO AND DENSITIES

A. Stabilized finish grade and stabilized shoulders shall have a minimum Limerock Bearing Ration (LBR) value of 40.

B. Field density of stabilized finished grade shall be a minimum of 98% of the Modified Proctor maximum dry density as specified in ASTM D1557 to a minimum depth of 12 inches as shown on the Drawings.

3.04 PRIME AND TACK COATS

A. The following sections of the Standard Specifications shall apply:

1. Section 300-3, Equipment.
2. Section 300-5, Cleaning Base and Protection of Adjacent Work.
3. Section 300-6, Weather Limitations.
4. Section 300-7, Application of Prime Coat.
5. Section 300-8, Application of Tack Coat.

3.05 ROCK BASE

A. The following sections of the Standard Specifications shall apply:

1. Section 200-3, Equipment.
2. Section 200-4, Transporting Rock.
3. Section 200-5, Spreading Rock.
4. Section 200-6, Compacting and Finishing Base.
5. Section 200-7, Acceptance Program.
6. Section 200-8, Priming and Maintaining.

B. Exceptions

1. Section 200-7.2.1, Density: The minimum density which will be acceptable for paved areas will be 98% of the maximum dry density as determined by Modified Proctor, ASTM D1557.

2. Section 200-7.3.1.2, Depth and Surface Testing Requirements: Thickness of base shall be measured at intervals not to exceed 200 feet.

3.06 ASPHALT

A. The following sections of the Standard Specifications shall apply:

1. Hot Mix Asphalt – Plant Methods and Equipment:

a. Section 320-6, Preparation of the Mixture.
b. Section 320-7, Transportation of the Mixture.

2. Hot Mix Asphalt – General Construction Requirements:

a. Section 330-1, Description.
b. Section 330-2, Quality Control (QC) Requirements.
c. Section 330-3, Limitations of Operations.
d. Section 330-4, Surface Preparation.
e. Section 330-5, Paving Equipment.
f. Section 330-6, Placing Mixture.
g. Section 330-7, Compacting Mixture.
h. Section 330-8, Joints.
i. Section 330-9, Surface Requirements.
j. Section 330-10, Protection of Finished Surface.

B. The Engineer reserves the right to test any portion of the roadway at any time.

C. Asphalt spread rate, tack, and temperature will be kept by the person responsible for quality control, and may be checked by the project's resident observer at any time.

3.07 PAVEMENT REPAIR

A. At his own expense the Contractor shall repair all damage to pavement as a result of work under this Contract in a manner satisfactory to the Engineer. Pavement shall be repaired to match the original surface material thickness and original grade. However, the asphalt concrete thickness shall not be less than 2 inches. The repair shall include preparing the subgrade, placing and compacting the applicable base, priming the limerock base, and placing and maintaining the surface treatment as specified in this Section.

B. The width of all repairs shall extend at least 12 inches beyond the limit of the damage. The edge of the pavement to be left in place shall be cut to a true edge with a saw or other approved method so as to provide a clean edge to abut the

repair. The line of the repair shall be reasonably uniform with no unnecessary irregularities.

3.08 JOINTS

A. General pavement joints within asphalt or concrete driveways and roadways and where specified or directed by the Engineer, shall be mechanically sawed butt joints. The edges of asphalt pavement shall be trimmed to straight lines which a roller can follow or formed.

3.09 RAISED RETROREFLECTIVE PAVEMENT MARKERS

A. The following sections of the Standard Specifications shall apply:

1. Section 706-3, Equipment.
2. Section 706-4, Application.
3. Section 706-5, Contractor's Responsibility for Notification.

3.10 TRAFFIC STRIPES AND MARKINGS

A. The following sections of the Standard Specifications shall apply:

1. Painted Pavement Markings:

    a. Section 710-3, Equipment.
    b. Section 710-4, Application.
    c. Section 710-5, Tolerances in Dimensions and in Alignment.
    d. Section 710-6, Contractor's Responsibility for Notification.
    e. Section 710-7, Protection of Newly Painted Pavement Markings.

2. Thermoplastic Pavement Markings:

    a. Section 711-3, Equipment.
    b. Section 711-4, Application.
    c. Section 711-5, Contractor's Responsibility for Notification.
    d. Section 711-6, Protection of Newly Applied Traffic Stripes and Markings.

END OF SECTION

SECTION 02740
DIRECTIONAL DRILLING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes furnishing all labor, materials, equipment, and incidentals necessary to complete each directional drill installation shown on the Drawings and as specified herein.

1.02 SUBMITTALS

The following shall be submitted in sufficient detail to show full compliance with the specification:

A. Qualifications: Submit statement of qualifications and records of previous similar jobs.

B. Product Pipe: Submit manufacturer's catalog data for the product pipe as required in the pipe specifications. The product data shall also include the dimension ratio, minimum allowable bending radius, and the safe pull force for each product pipe being installed by directional drill.

C. Drilling Fluids: Submit a complete list of all drilling fluids, additives, and mixtures to be used along with Material Safety Data Sheets.

D. Software: Submit indication of the software that the Contractor will use to perform analyses in accordance with Article 1.03, Quality Assurance.

E. Analyses: Submit software analyses results in accordance with Article 1.03, Quality Assurance.

F. Contingency Plan: Submit a hydraulic fracture (frac-out) contingency plan in accordance with Article 1.03, Quality Assurance.

G. Equipment: Submit a description of the rig(s) proposed for the project at each location, showing the method of control of the boring head, head type, pulling force of the equipment, age, reamer type(s), manufacturer type, and other germane information. This information shall demonstrate that the equipment pulling force is at least 1.25 the maximum calculated peak-pulling requirement.

H. Certificates: Submit statement that the Contractor has inspected the drill equipment including the drill rod and determined that they are in satisfactory condition for its intended use.

I. Bore Plan: The Contractor shall submit a signed-and-sealed bore plan before commencing drilling activities.

J. Record Drawings: Submit an electronic copy and three hard copies of the record drawings within 5 days after completing the pull back in accordance with the Article 1.06, Record Drawings.

K. Drilling Logs: Maintain and submit upon completion of work complete drilling logs of guided directional drill operations.

1.03 QUALITY ASSURANCE

A. The proposed product pipe installation lengths, depths, and curvatures presented on the Drawings are for bidding purposes only. The Contractor shall be solely responsible for the successful installation of each product pipe. The Contractor shall analyze each installation and make modifications necessary to successfully install each product pipe.

B. The Contractor shall analyze each installation using BoreAid ™, DrillPath ™, or other approved software and perform hand calculations as necessary if the Contractor's software is not capable performing all of the required analyses. The results of the analyses/calculations shall be submitted and shall include as a minimum the following:

1. Proposed entry and exit angles.
2. Proposed radii of curvature for all directional changes.
3. Proposed profile and drill path. The profile shall show ground surfaces, waterway bottoms/beds (if applicable), and proposed product pipe installation.
4. Product pipe deflection, buckling, external pressure, and stress calculations demonstrating that the forces/stresses exerted on the product pipe during and after installation will not exceed 80% of the manufacturer's safe limits.
5. Pull back force calculations demonstrating that peak pulling requirement does not exceed 80% of the manufacturer's safe pull pack force.
6. Maximum borehole pressure calculations and demonstration that the maximum borehole pressure will not result in a hydraulic fracture (frac-out).
7. Method of buoyancy control (if required/used) to reduce forces/stresses exerted on the product pipe.

C. The Contractor shall submit a frac-out contingency plan that describes frac-out planning, prevention, monitoring, response, notification to the Owner, Engineer, and regulatory agencies, and cleanup procedures.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Delivery, storage, and handling shall be in accordance with Section 01650, Delivery, Storage, and Handling, and the additional requirements herein.

B. Inspect materials delivered to the site for damage. All materials found during inspection or during the progress of work to have cracks, flaws, surface abrasions, or other defects shall be rejected and removed from the job site.

C. Disposal of fluids is the responsibility of the Contractor. Disposal of fluids shall be done in a manner that is in compliance with all permits and applicable federal, state, and local regulations.

1.05 QUALIFICATIONS

A. The Contractor's superintendent and driller assigned to this project must be experienced in work of this nature and must have successfully completed a minimum of five similar projects of similar length, pipe type, pipe size, and soil type using directional drilling in the last 3 years. Conventional open-trenching experience or bore-and-jacking experience will not be acceptable substitutes for directional drilling experience.

B. As part of the bid submission, the Contractor shall submit documentation of such project(s). The documentation for experience shall include but not be limited to the following:

1. Name(s) and description(s) of project(s).
2. Résumés of project manager, superintendent, and driller assigned to the specific project.
3. Pipe type(s), diameter(s), and lengths.
4. Type and manufacturer of equipment used.
5. Soil conditions encountered.
6. Start and completion dates.
7. Contact names, numbers, and addresses.

1.06 RECORD DRAWINGS

A. The record drawings shall include a plan, profile, and all information recorded during the progress of the work. The Record Drawings shall be tied to the project's survey control.

1.07 DEFINITIONS

A. *Horizontal Directional Drilling (HDD):* A steer-able system for the underground installation of pipes, conduits, and cables using a surface launched rig. A pilot bore is drilled using a rotating drill string and then is enlarged by a back reamer to the size required for the product pipe. The necessary deviation during pilot boring is provided by a slanted face to the drill head, an asymmetric drill head, eccentric fluid jets, or a combination of these, usually in conjunction with an aboveground electronic locator or a remote guidance system.

B. *Maxi (Conventional) HDD*: Typically used for the largest-diameter pipelines/ conduits and longest length installations. Pipe diameters are typically 18 inches or larger, lengths can exceed 1,000 feet, and the pullback force is typically in excess of 70,000 pounds. The drill string is usually remote tracked provided from sensors near the leading end of the drill string.

C. *Mini HDD:* Typically used for the smaller diameter pipelines/conduits and for shorter distances. Pipe diameters are typically 6 inches or smaller, lengths are less than 600 feet, and pullback forces are up to 20,000 pounds. The drill string is typically tracked with a surface held walkover transmitter/receiver.

D. *Midi HDD:* Typically used for intermediate sizes and lengths of pipelines/ conduits. Pipelines are typically between 6 inches and 18 inches diameter, lengths are up to 1,000 feet, and pullback forces from 20,000 to 70,000 pounds. Midi HDD equipment may employ similar capabilities to the Maxi HDD rigs but have more limitations on capacity. The drill string is typically tracked with a surface held walkover transmitter/receiver.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Boring equipment shall be matched to the conditions of the project and shall have a pulling force at least 1.25 the maximum calculated peak-pulling requirement for each installation given the site-specific conditions.

B. Boring equipment shall have a mechanical drilling rig with a controlled directional boring head using either a fluid or mechanical cutting head (or

combination of both), assisted and cooled by an approved drilling fluid of low pressure and volume.

C. Approved boring equipment shall be that manufactured by American Augers, Case Construction, Charles Machine Works (Ditch Witch), Straight Line, Tulsa Rig Iron, Vermeer, or approved equal.

D. The location/tracking system employed for determining the location of the drilling head during the pilot bore shall include but not be limited to the position of the boring head, the roll angle, the tilt angle, depth below grade, temperature of data transmitter, and remaining battery life.

E. The Contractor shall select the appropriate drill equipment, which at least meets the minimum requirements established in this specification, to be used for this project.

F. The drill equipment including rod shall be inspected and approved for use by the Contractor before arrival at the work site.

2.02 DRILLING FLUIDS

A. A high-quality drilling fluid shall be used to ensure hole stability, cuttings transport, bit and electronics cooling, and hole lubrication to reduce drag on the drill pipe and the product pipe. Composition of the fluid must comply with all federal, state, and local environmental regulations.

B. The drilling fluid shall be a bentonite slurry mixed with potable or reclaimed water (of proper pH) to ensure no contamination is introduced into the soil during the drilling, reaming, or pipe installation process. The Contractor is responsible for any required pH adjustments. A polymer-based slurry will be considered only if the Contractor demonstrates that a bentonite slurry will not suitable for this project and the proposed polymer slurry is acceptable to the Florida Department of Environmental Protection. Drilling fluids that are petroleum-based or that contain additives that may contaminate the surrounding soils or groundwater shall not be allowed.

C. The type of proposed drilling fluid with a complete listing of all additives along with Material Safety Data Sheets shall be submitted for approval before work begins.

D. Potable water or reclaimed water will be made available to the Contractor. This water will be metered and invoiced to the Contractor at the current effective rate.

2.03 PRODUCT PIPE

A. The nominal diameter and material type of each product pipe shall be as shown on the Drawings.

B. High-Density Polyethylene (HDPE) pipe shall conform to the requirements of Section 15146, High-Density Polyethylene (HDPE) Pipe. The maximum dimension ratio (i.e., the thinnest allowable wall thickness) for HDPE pipe being installed by direction drill shall be 11 (DR11).

PART 3 EXECUTION

3.01 GENERAL

A. No work or drilling shall commence until the Contractor has submitted the required information and a signed-and-sealed bore plan and received written approval from the Engineer regarding the drill path and related procedures.

B. The Contractor shall locate all utilities, structures, etc., within the construction area before any work begins and before equipment is mobilized.

C. Before drilling operations begin, all erosion control devices and dewatering shall be in-place and functional in accordance with Section 02240, Dewatering, and the Contract Documents.

D. The boring rig shall be sufficiently and adequately anchored for the task.

E. Directional drilling equipment machine safety requirements shall include common grounding system to prevent electrical shock in the event of underground electrical cable strike. The grounding system shall connect all pieces of interconnecting machinery; the drill, mud mixing system, drill power unit, drill rod trailer, operator’s booth, worker grounding mats, and any other interconnected equipment to a common ground. The drill shall be equipped with an "electrical strike" audible and visual warning system that will notify the system operators of an electrical strike.

F. The Contractor shall conform to all requirements of Section 02305, Earthwork for Utilities, including, but not limited to, excavation, protection of persons and property, sheeting and shoring, backfill and compaction, and disposal of excess and waste materials.

G. The Contractor shall be responsible for transporting, containing, and storing any water required for the drilling operations, cleanup, and other needs.

H. All drilling fluid excess shall be contained in entry and/or exit pits and pumped/treated/stored as needed to preclude spills and escape to the surrounding environment. Ensure that entry and exit pits are of sufficient size and volume to contain the expected return of drilling fluids and cuttings.

I. Drilling fluid returns can be collected in the entrance pit, exit pit, or spoils recovery pit. The Contractor shall immediately clean up any drilling fluid spills or overflows from these pits.

J. Disposal of the drilling fluids shall be the responsibility of the Contractor and shall be conducted in compliance with all relative environmental regulations, right-of-way and workspace agreements, and permit requirements.

K. The product pipe shall be installed within the limits indicated on the Drawings.

3.02 DRILL SET-UP AND PITS

A. The Contractor may use the set-up areas identified on the Drawings. If additional areas are required, the Contractor shall be responsible for coordinating the additional areas at no additional cost to the Owner.

B. Drill entrance and exit pits are required. The Contractor shall be responsible for design and construction of the drill entrance and exit pits.

C. The drill entrance and exit pits shall be maintained at minimum size to allow only the minimum amount of drilling fluid storage before transfer to mud recycling or processing system or removal from the site.

D. Drilling mud shall not be allowed to flow freely on the site or around the entrance or exit pits. Erosion and sediment control devices shall be set up around each pit. Mud spilled shall be removed as soon as possible and the ground restored to original condition. Pits shall be shored to OSHA standards and the requirement of Section 02305, Earthwork for Utilities.

3.03 DRILL ENTRANCE AND EXIT ANGLE

A. The entrance and exit angles shall such that the elevation profile maintains adequate cover to reduce risk of frac-out and that ground exit occurs as specified herein. The Contractor shall be responsible for ensuring that entrance and exit angles ensure pullback forces do not over stress the pipe.

B. In no case shall the entry or exit angles of the installed pipeline shall be less than 8 degrees from the horizontal and or more than 18 degrees from the horizontal.

C. In addition to the allowable limits of Paragraph 3.04B, the entry and exit angles shall in accordance with those used in the analyses performed in Article 1.03, Quality Assurance.

3.04 PILOT HOLE

A. A pilot hole shall be drilled for all product pipe installations 6-inch-diameter and larger.

B. The type and size of the pilot string cutting head and the diameter of the drill rod shall be selected by the Contractor for each specific application.

C. The cutting head shall be assisted by and cooled by drilling fluid of low pressure and volume.

D. The pilot hole shall be drilled along the approved path. Pilot hole tolerances are as follows:

1. Vertical tolerance: Provide cover in accordance with the approved profile developed under Article 1.03, Quality Assurance.
2. Horizontal tolerance: 3 feet from the centerline of the product pipe.
3. Curve Radius: No curve will be accepted with a radius less than 1.25 times the manufacturer's recommended minimum bending radius for the product pipe being installed by directional drill. NOTE: There are additional stresses imposed on the product pipe due to pulling it around curves versus bending the product pipe in a trench. The minimum bending radius for a product pipe installed by direction drill is greater than the minimum bending radius for the same product pipe installed in a trench.
4. Entry Point Location: The pilot hole entry point shall be established by the Contractor.
5. Exit Point Location: The exit point location shall be established by the Contractor.
6. The installed pipeline cover requirements as shown on the drawings and as specified herein shall not be violated.

E. If significant differing soils or strata from those provided in the geotechnical data and reports are encountered during the pilot boring, the Contractor shall be responsible for changing the drill head and slurry and other means as may be appropriate to complete the bore.

F. The Contractor shall adjust the viscosity of the drilling fluid to match the conditions of the project. The Owner shall bear no responsibility for loss of drilling fluid or loss of drilling equipment if an obstacle or unknown condition is encountered during the work.

G. The Owner shall not be responsible for underground obstacles (such as boulders, tree stumps, loose and unconsolidated soils, hard rock, or utilities) or structures that may be encountered during the work.

H. If hydraulic fracture occurs, the Contractor shall implement the approved frac-out contingency plan and repair all related damages, cleanup of fluids, and make corrections to preclude future events. Such corrections may include but not be limited to re-profiling the bore or changing the viscosity of the drilling fluid or plugging the fracture or a combination of these. If the borehole is abandoned and an alternate route is chosen, the abandoned borehole shall be filled with excavatable flowable fill.

I. Where construction activities are close to or under water bodies (lakes, creeks, canals, retention basins) or wetlands, special attention shall be given to the proposed profile to ensure that hydraulic fracture does not occur under the water feature. Additionally, silt fences and similar approved erosion control devices shall be used to protect the water body(s) from the construction activities.

3.05 BACK-REAMING

A. Back-reaming shall be required for all product pipe installation 6-inch-diameter and larger.

B. The type of back-reamer to be utilized shall be determined by the type of subsurface soil conditions that are encountered during the pilot hole drilling operation. The back-reamer type shall be selected by the Contractor for each specific application.

C. Back-reaming shall be conducted in single or multiple passes of the borehole and shall enlarge the borehole to at least 1.4 times the outer diameter of the product pipe to be installed. Larger reaming may be required depending on subsurface conditions encountered. The number of back-reaming passes and the borehole size, provided the minimum requirements are met, shall be the Contractor’s discretion.

3.06 PULL BACK

A. Unless approved otherwise, the entire product pipeline to be installed via directional drill shall be fully assembled before commencement of pull back operations.

B. The product pipeline shall be supported during pullback operations in a manner to enable it to move freely and prevent damage. Properly spaced rollers and at

proper heights shall be used to transition the product pipe from the horizontal to oblique positions for insertion into the borehole.

C. Unless approved otherwise, the product pipeline shall be installed in one continuous pull.

D. The product pipe shall be installed with a continuous #10-gauge tracer wire of sufficient type to remain intact and usable upon completion of the installed product pipe.

E. Torsional stress shall be minimized by using a swivel to connect the pull section to the reaming assembly.

F. Maximum allowable tensile force imposed on the pull section shall not exceed 80% of the pipe manufacturer's safe pull (or tensile) strength. If the pull section is made up of multiple pipe size or materials, the lowest safe pull strength value shall govern and the maximum allowable tensile force shall not exceed 80% of this value.

G. External pressure shall be minimized during installation of the pullback section in the reamed hole. Damaged pipe resulting from external pressure shall be replaced at no cost to the Owner. Buoyancy modification shall be at the discretion of the Contractor.

H. The Contractor shall take precautions to protect the product pipeline from damage and marring during the installation and pullback operation. Such precautions shall include but not be limited to using rollers, pulleys, idlers, and trunnions.

I. After pullback is completed, the Contractor shall “rest” the product pipeline to allow for any contraction and shrinkage for at least 24 hours. No additional work on the pulled product pipeline shall be allowed during the resting period.

3.07 GUIDANCE SYSTEMS

A. Walkover guidance systems are acceptable for this project. A magnetic survey tool located behind the pilot string cutting head shall also be used for this project.

3.08 DOCUMENTATION

A. The Contractor shall maintain drilling logs that accurately provide drill bit location (both horizontally and vertically) at least every 15 feet along the drill path. In addition, logs shall be kept that record, as a minimum, the following

every 15 minutes throughout each drill pass, back-reaming pass, or product pipe installation pass:

1. Drilling fluid pressure.
2. Drilling fluid flow rate.
3. Drilling fluid temperature.
4. Drill thrust force.
5. Drill pullback force.
6. Drill head torque.

B. Each day, the Contractor shall also record the total amount of drilling mud used and viscosity of the drilling mud. If the viscosity of the drilling mud is changed, the Contractor shall record the new viscosity and the time the mud viscosity was changed.

C. Samples of each log sheet shall be submitted to the Owner/Engineer for approval before work begins.

D. The Engineer shall have access to instrumentation, readings, and logs at all times during operation.

E. After the pull is completed, the Contractor shall provide Record Drawing information of the installed product pipeline. The Record Drawing information shall provide the horizontal and vertical location of the product pipeline tied to the project control datum. At a minimum, the entry and exit locations, angles, and elevations shall be recorded and the locations and depths of the product pipeline shall be recorded at intervals along the entire length of the profile. For profiles under non-submerged surfaces, the interval shall be 10 feet. For profiles under submerged surfaces (such as a lake, stream, canal, or river), the interval shall be 20-foot. This information shall be provided to the Owner/Engineer within 7 calendar days after the completion of each bore path.

3.09 MAINTENANCE OF TRAFFIC

A. During assembly and pullback of the pipe, the pipe must be laid out in such a way to minimize disrupting and interfering with vehicular and pedestrian traffic or other operational conflicts that the Owner/Engineer identify.

B. The Contractor shall be responsible for safe maintenance of pedestrian and vehicular of traffic. If the construction activities require such action a maintenance-of-traffic plan shall be submitted to the Owner/Engineer for approval before work begins. The plan shall be in accordance with Florida Department of Transportation Standard Index 600 Series and Technical Specifications.

3.10 UTILITY LOCATES

A. The Contractor shall locate all utilities before start of excavation or drilling. The Contractor shall be responsible for damage to utilities and shall repair damaged utilities at no cost to the Owner.

3.11 CLEANUP

A. Immediately upon completion of work of this Section, all rubbish and debris shall be removed from the job site. All construction equipment and implements of service shall be removed and the entire area involved shall be left in a neat condition acceptable to the Engineer.

B. "Blow holes" or "breakouts" of drilling fluid to the surface shall be cleaned up immediately and the surface area returned to its original condition. All drilling fluids, spoils, and separated materials shall be disposed of in compliance with federal, state, and local environmental regulations.

C. After the product pipe installation is completed, the Contractor shall restore the pits and drill rig anchors and work areas to their pre-construction or better condition. Seeding shall not be allowed in lieu of sod unless granted in writing by the Owner/Engineer.

END OF SECTION

SECTION 02920
SEEDING AND SODDING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall provide all materials, equipment, labor, and work to construct the project in accordance with the Contract Documents. No time extensions shall be given to the Contractor for not establishing a grass or sod cover during the "proper" planting season.

B. This work includes but is not limited to the following items specified in this Section:

1. Placing sod to provide grass as finished ground cover at all unpaved disturbed areas of the site, including the entire areas of the ponds shall be as indicated on the Contract Drawings.
2. Placing seed to provide grass as finished ground cover in areas (not designated to be sodded) that were disturbed by the work. Provide seed and topsoil for all areas not designated to be sodded that have been disturbed or are indicated on the Contract Drawings to be seeded.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction, latest edition:

1. FDOT Section 570 Performance Turf.
2. FDOT Section 981 Turf Materials.
3. FDOT Section 982 Fertilizer.
4. FDOT Section 983 Water for Grassing.
5. FDOT Section 987 Soil Layer Materials.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. Deliver, store, protect, and handle products to the site to prevent damage from wetness and weather conditions.

C. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

D. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of the manufacturer.

1.06 MAINTENANCE

A. Maintenance shall be as indicated under Part 3, Execution, of this Section.

1.07 DEFINITIONS

A. Weeds: Weeds include but are not limited to Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragqwort, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.08 REGULATORY REQUIREMENTS

A. The Contractor shall comply with regulatory agencies for fertilizer and herbicide composition.

PART 2 PRODUCTS

2.01 GENERAL (NOT USED)

2.02 MATERIALS

A. Topsoil

1. Top soil shall be supplied and installed in accordance with FDOT Standard Section 987.

B. Fertilizer

1. Fertilizer shall be a complete, commercial-grade mixture of 12-8-8 analysis.
2. Fertilizer shall conform to applicable state laws for the material used.
3. Commercial-grade mixture shall conform to FDOT Standards, Section 982.

C. Mulch

1. Mulch shall conform to FDOT Standards, Section 981.
2. Mulch shall be dry grain straw or hay, free of noxious weeds.
3. Mulch shall be thoroughly cured and dried before use.
4. Forest litter, pine needles, or Spanish Moss will not be acceptable.

D. Seed

1. All grass seed shall be the product of a reputable supplier and shall conform to the requirements of the State Department of Agriculture and Consumer Services and all applicable state laws.
2. Grass seed shall conform to FDOT Standards Section 981, with a minimum 80% purity and 80% germination with no noxious weeds.
3. Seed shall be Argentine Bahia applied at a minimum rate of 10 pounds per 1,000 square feet. A thick stand of grass shall be provided.

E. Sod

1. Sod shall conform to FDOT Standards Section 981. A thick stand of grass shall be provided at all locations.
2. Sod shall be Argentine Bahia.
3. Sod planted on private properties shall match the existing sod when practical.

F. Water

1. The water used to produce grass may be obtained from any approved source, in accordance with FDOT Section 983. The water shall be free of excess and harmful chemicals, acids, alkalies, and all substances which may be harmful to plant growth or obnoxious to traffic. Salt or brackish water shall not be used. The Contractor shall make arrangements to secure and pay for water. The Contractor shall make all provisions necessary to water until a thick stand of grass is established.

PART 3 EXECUTION

3.01 SURFACE PREPARATION

A. The entire area to be seeded, as shown on the Drawings or required in this Section, shall be covered with a 6-inch layer of muck or suitable topsoil, carefully spread and disked lightly into the existing soil and finished to the grades indicated.

3.02 FERTILIZING

A. Fertilizer shall be applied uniformly on the surface of the ground at a minimum rate as specified in Section 570 of FDOT Specifications. It shall be mixed into the soil with a disk harrow, where practicable, or by hand-raking in areas of limited accessibility. Mixing shall be continued until the fertilizer is uniformly incorporated into the top 3 inches of soil.

3.03 MULCHING

A. After spreading and mixing the fertilizer, the Contractor shall apply approximately 2 inches, loose thickness, of the mulch material uniformly over the grassing area and cut into the soil to produce a loose mulch thickness of 3 to 4 inches, in accordance with Section 570 of FDOT Specifications. Care shall be exercised to prevent the mulch from being cut too deeply into the soil.

3.04 SEEDING

A. Seed which has become wet or moldy shall not be used. Soon after the mulch material has been cut into the soil and while the soil is still loose and moist, the seed shall be scattered uniformly over the grassing area. Application shall be in conformance with FDOT Standards, Section 570.

3.05 SODDING

A. Application shall be in accordance with FDOT Standards, Section 575.

3.06 WEED CONTROL

A. The Contractor shall apply herbicides as required and as recommended by the County Agricultural Agent. Herbicides shall only be applied as needed.

3.07 COMPACTION

A. Immediately after the seeding is complete, the entire grassed or mulched area shall be compacted with a light roller. Rolling shall be continued until the area is firmly but not tightly packed.

3.08 EQUIPMENT

A. All equipment used in the operation of grassing shall be adequate to produce the required results. Equipment for placing mulch material into the soil shall be suitable for cutting the specified materials uniformly into the soil and to the required controlled depth. Rollers shall have corrugated or notched surfaces and shall be at least 12 inches in diameter. Smooth surface rollers will not be permitted.

3.09 GROUND COVER DATA

A. Planting dates, types of seeds, seed mixtures, and rates of application shall be as set forth in this Section. No changes may be made in the ground cover type without the approval of the Engineer.

3.10 GROUND COVER ESTABLISHMENT

A. General Requirements

1. The Contractor shall provide ground cover (sod and seed) establishment of the specified permanent vegetation before final acceptance of the project with no dead areas of ground cover. Groundcover (sod and seed) establishment shall consist of necessary preserving and protecting to keep the grassed areas in a satisfactory condition. The Contractor shall water the grassed areas as long and as often as necessary to promote maximum practicable growth. At any time, the Engineer may require replanting an area or portion of an area which, for any cause, shows unsatisfactory growth. Except as otherwise specified or permitted by the Engineer, the Contractor shall prepare areas to be replanted in accordance with the

requirements of the Specifications as if such replanting were the initial planting. However, the type of fertilizer and the applicable rate of fertilizer to be furnished and applied by the Contractor as part of plant establishment occasioned by replanting shall be determined by soil tests or otherwise established.

B. Growth and Coverage

1. The Contractor shall be responsible for providing satisfactory growth and coverage as defined below. Growth and coverage shall be considered acceptable when all areas show a satisfactory visible growth with no bare spots larger than 1 square foot. Bare spots shall be scattered, and the total bare areas should not comprise more than 1/100 of any given area.

3.11 EXTENT OF SOD/GRASS MAINTENANCE

A. The Contractor is responsible for all sod and grass maintenance until the date of final completion of the project. Sod and grass maintenance include cutting, watering, fertilizing, re-seeding, and re-sodding as required to maintain the required coverage of healthy, vibrant grass and sod cover.

END OF SECTION

DIVISION 3

CONCRETE

SECTION 03301
CONCRETE AND REINFORCING STEEL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and incidentals required to perform all concrete work as ordered by the Engineer, as shown on the Drawings, and as specified in this Section.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance. Reproductions of contract drawing are unacceptable. Submit full fabrication drawings and technical data on all materials and components. Submit other data specified in this Section when required. Submittals shall include at least the followings:

A. Shop Drawings and Technical Data

1. Joints and joint accessories.
2. Reinforcing steel including bar schedules and bending details.
3. Concrete mix for each formulation of concrete proposed for use, including constituent quantities per cubic yard, water cementitious ratio, type, and manufacturer of cement.
4. Formwork and accessories.
5. Grout.
6. Each type of mechanical reinforcing steel connector.

B. Samples

1. Two samples of each type of mechanical reinforcing steel connection.

C. Test Reports

1. Sieve analysis of fine and coarse aggregates.

2. Concrete mix for each formulation of concrete proposed for use, including constituent quantities per cubic yard, water cementitious ratio, type and manufacturer of cement, and either a. or b. below:

a. Standard deviation data for each proposed concrete mix based on statistical records.

b. Water cementitious ratio curve for each proposed concrete mix based on laboratory tests. Give average cylinder strength test results at 28 days for laboratory concrete mix designs. Provide results of 7- and 14-day tests if available.

3. Concrete compressive strength, air content, and slump tests.

D. Certifications

1. Certify that admixtures used in the same concrete mix are compatible with each other and the aggregates.
2. Material Safety Data Sheet (MSDS).
3. Curing concrete elements.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Concrete Institute (ACI)

1. ACI 117—Specification for Tolerances for Concrete Construction and Materials and Commentary.
2. ACI 211.1—Standard Practice for Selecting proportions for Normal, Heavyweight, and Mass Concrete.
3. ACI 301—Specifications for Structural Concrete.
4. ACI 305R—Guide to Hot Weather Concreting.
5. ACI 306R—Guide to Cold Weather Concreting.
6. ACI 306.1—Standard Specification for Cold Weather Concreting.
7. ACI 315—Details and Detailing of Concrete Reinforcement.
8. ACI 318—Building Code Requirements for Structural Concrete and Commentary.
9. ACI 347R—Guide to Formwork for Concrete.
10. ACI 350R—Environmental Engineering Concrete Structures.
11. ACI MCP-4—Manual of Concrete Practice – Volume 4.

B. American Society for Testing and Materials (ASTM)

1. ASTM A615/A615M—Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
2. ASTM A1064/A1064M—Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

3. ASTM C31/C31M—Standard Practice for Making and Curing Concrete Test Specimens in the Field.
4. ASTM C33/C33M—Standard Specification for Concrete Aggregates.
5. ASTM C94/C94M—Standard Specification for Ready-Mixed Concrete.
6. ASTM C143/C143M—Standard Test Method for Slump of Hydraulic-Cement Concrete.
7. ASTM C150/C150M—Standard Specification for Portland Cement.
8. ASTM C171—Standard Specification for Sheet Materials for Curing Concrete.
9. ASTM C173/C174M—Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
10. ASTM C231/C231M—Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
11. ASTM C260/C260M—Standard Specification for Air-Entraining Admixtures for Concrete.
12. ASTM C309—Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
13. ASTM C494/C494M—Standard Specification for Chemical Admixtures for Concrete.
14. ASTM C618—Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
15. ASTM C827/C827M—Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures.
16. ASTM C881/C881M—Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
17. ASTM C920—Standard Specification for Elastomeric Joint Sealants.
18. ASTM C932—Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering.
19. ASTM C990—Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.
20. ASTM C1107/C1107M—Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
21. ASTM C1116/C1116M—Standard Specification for Fiber-Reinforced Concrete.
22. ASTM D1751—Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
23. ASTM D1752—Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
24. ASTM D2103—Standard Specification for Polyethylene Film and Sheeting.

25. ASTM D4397—Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
26. ASTM D6690—Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

C. Concrete Reinforcing Steel Institute (CRSI)

1. MSP—Manual of Standard Practice.

1.04 QUALITY ASSURANCE

A. Reinforced concrete shall comply with ACI 318; the recommendations of ACI 350R; and other stated requirements, codes, and standards. The most stringent requirement of the codes, standards, and this Section shall apply when conflicts exist.

B. Only one source of cement and aggregates shall be used on any one structure. Concrete shall be uniform in color and appearance.

C. Thirty days in advance of placing concrete, the Contractor shall discuss with the Engineer the sources of individual materials and batched concrete proposed for use. Discuss placement methods, waterstops, and curing. Propose methods of hot and cold weather concreting as required. Before placing any concrete containing a high-range water-reducing admixture (plasticizer), the Contractor, accompanied by the plasticizer manufacturer, shall discuss with the Engineer the properties and techniques of batching and placing plasticized concrete.

D. A firm providing field testing and inspection services will be approved by the Owner. The cost of such work, except as specifically stated otherwise, shall be paid by the Contractor and reimbursed by the Owner under the Concrete Testing Allowance. The following items shall be tested by the Owner to verify conformity with this Section:

1. Concrete placements—compressive strength (cylinders), compressive strength (cores), slump, and air content.
2. Other materials or products that may come under question.
3. All materials incorporated in the work shall conform to accepted samples.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

B. Furnish the Owner with a written warranty that the mechanical splice system is free from manufacturing defects and will perform as represented.

PART 2 PRODUCTS

2.01 GENERAL

A. The use of the manufacturer's name and model or catalog number is to establish the standard of quality and general configuration desired.

B. Like items of materials shall be the end products of one manufacturer to provide standardization of appearance, maintenance, and manufacturer's service.

C. Materials shall comply with this Section and any applicable State or local requirements.

2.02 MATERIALS

A. Cement: Domestic Portland cement complying with ASTM C150/C150M. Air entraining cements shall not be used. The brand of cement shall be subject to approval by the Engineer and one brand shall be used throughout the Work. The following cement type(s) shall be used:

1. Class A, B, C, D Concrete Type II with the addition of fly ash resulting in C3A being below 5% of total cementitious content, Type III limited to 5% C3A, or Type V.

B. Aggregate: Washed inert natural sand conforming to the requirements of ASTM C33/C33M.

C. Water: Potable water free from injurious amounts of oils, acids, alkalis, salts, organic matter, or other deleterious substances.

D. Admixtures: Admixtures shall be free of chlorides and alkalis (except for those attributable to water). When more than one admixture is required to be used in a concrete mix, the admixtures shall be from the same manufacturer. Admixtures shall be compatible with the concrete mix, including other admixtures, and shall be suitable for use in contact with potable water after 30 days of concrete curing.

1. Air-Entraining Admixture—The admixture shall comply with ASTM C260/C260M.
2. Water-Reducing Agent—The admixture shall comply with ASTM C494/C494M, Type A.

3. High-Range Water-Reducer (Plasticizer)—The admixture shall comply with ASTM C494/C494M, Type F and shall result in non-segregating plasticized concrete with little bleeding and with the physical properties of low water/cement ratio concrete. The treated concrete shall be capable of maintaining its plastic state more than 2 hours.
4. Admixtures causing retarded or accelerated setting of concrete shall not be used without written approval from the Engineer. When allowed, the admixtures shall be retarding or accelerating water-reducing or high-range water-reducing admixtures.

E. Pozzolan (Fly Ash) shall be Class F fly ash complying with ASTM C618, except that the Loss on Ignition (LOI) shall be limited to 3% maximum.

F. Materials for Curing Concrete

1. Sheet Curing Materials—Waterproof paper, polyethylene film, or white burlap polyethylene sheeting shall comply with ASTM C171.
2. Liquid Curing Compound—Liquid membrane forming curing compound shall comply with the requirements of ASTM C309, Type 1 D (clear or translucent with fugitive dye) and shall contain no wax, paraffin, or oil. The curing compound shall be approved for use in contact with potable water after 30 days according to NSF 61 (non-toxic and free of taste or odor).

G. Chemical hardener shall be Lapidolith by Sonneborn, Hornolith by A.C. Horn, Penalith by W.R. Meadows, or equal fluosilicate base material.

H. Concrete sealer shall be "Kure N Seal," by Sonneborn, Minneapolis, MN, or equal.

2.03 MIXES

A. Select proportions of ingredients to meet the design strength and materials limits specified in Table 1 and to produce concrete having proper workability, durability, strength, appearance, and other required properties. Proportion ingredients to produce a homogenous mixture, which will readily work into corners and angles of forms and around reinforcement without permitting materials to segregate or allowing excessive free water to collect on the surface.

B. The design mix shall be based on standard deviation data of prior mixes with essentially the same proportions of the same constituents or, if such data are not available, be developed by a testing laboratory acceptable to the Engineer and engaged by and at the expense of the Contractor. Mixes based on standard deviation shall be accepted based on the modification factors for standard

deviation tests contained in ACI 318. The water content of the concrete mix, determined by laboratory testing, shall be based on a curve showing the relation between water cementitious ratio and 7- and 28-day compressive strengths of concrete made using the proposed materials. The curves shall be determined by four or more points, each representing an average value of at least three test specimens at each age. The curves shall have a range of values sufficient to yield the desired data, including the specified design strengths as modified below, without extrapolation. The water content of the concrete mixes to be used, as determined from the curve, shall correspond to strengths 16% greater than the specified design strengths. The resulting mix shall not conflict with the limiting values for maximum water cementitious ratio and net minimum cementitious content as specified in Table 1.

C. Entrained air, as measured by ASTM C231/C231M, shall be as shown in Table 1.

1. If the air-entraining agent proposed for use in the mix requires testing methods other than those in ASTM C231/C231M to accurately determine air content, make special note of this requirement in the admixture submittal.

D. Slump of the concrete as measured by ASTM C143/C143M shall be as shown in Table 1. If a high-range water-reducer (plasticizer) is used, the slump indicated shall be that measured before plasticizer is added. Plasticized concrete shall have a slump ranging from 7 to 10 inches.

TABLE 1
CONCRETE MIX REQUIREMENTS

Class	Design Strength (1)	Cement (2)	Fine Aggregate (2)	Coarse Aggregate (3)	Cementitious Content (4)
A	2500	C150 Type II	C33	57	440 min.
B	3000	C150 Type II	C33	57	480 min.
C	4000	C150 Type II	C33	57	560 min.
D	5000	C150 Type II	C33	57	600 min.

Class	W/C Ratio (5)	Fly Ash	AE Range (6)	WR (7)	HRWR (8)	Slump Range (Inches)
A	0.60 max.	--	3.5 to 5	Yes	*	1-4
B	0.54 max.	--	2.5 to 5	Yes	*	1-3
C	0.44 max.	20 – 25%	2.5 to 5	Yes	*	3-5
D	0.40 max.	--	3.5 to 5	Yes	*	3-5

NOTES:
(1) Minimum compressive strength in psi at 28 days.
(2) ASTM designation.
(3) Size Number in ASTM C33/C33M.
(4) Cementitious content in pounds/cubic yard.
(5) W/C is Water-Cementitious ratio by weight.
(6) AE is percent air-entrainment.
(7) WR is water-reducer admixture.
(8) HRWR is high-range water-reducer admixture.
* HRWR used at the Contractor's option.

2.04 CONCRETE REINFORCEMENT

A. Reinforcing steel shall be deformed bars and shall comply with ASTM A615/A615M, Grade 60.

B. Welded wire fabric shall be flat sheet and comply with ASTM A1064/A1064M.

C. Fiber reinforcement shall be synthetic fibers with 100% polypropylene collated, fibrillated fibers and with a minimum tensile strength of 70 ksi. Fiber-reinforced concrete shall be in accordance with ASTM C1116/C1116M, Type III, Synthetic Fiber-Reinforced Concrete. Use a minimum of 1.5 pounds of fibers per cubic yard of concrete. Add fibers at the batch plant.

2.05 FORMS

A. Forms for cast-in-place concrete shall be made of wood, metal, or other approved material. All forms shall be designed and constructed to provide a flat, uniform concrete surface requiring minimal finish or repairs.

B. Forms shall be free from roughness and imperfections, substantially watertight, and adequately braced and tied to prevent motion when concrete is placed. No wooden spreaders will be allowed in the concrete.

C. The form-release agent shall be coated on all surfaces in contact with concrete using effective, non-staining, non-residual, water-based, bond-breaking form coatings.

D. Wire ties will not be allowed. Metal ties or anchorages necessary within the forms shall be so constructed that the metal work can be removed for a depth of at least

1 inch from the surface of the concrete without injury to such surface by spalling or otherwise. Forms shall be thoroughly cleaned before using and shall be treated with oil or other approved material.

E. All exposed edges of the finished concrete shall be chamfered 3/4 inch.

2.06 EXPANSION/CONTRACTION JOINTS

A. Pre-molded joint fillers for water holding structures shall be non-extruding and resilient non-bituminous type and comply with ASTM D1752, Type III. Joint fillers for sidewalk and roadway pavements shall be asphalt-impregnated fiber board conforming to ASTM D1751.

B. Joint sealants shall comply with ASTM D6690, Type M class 25 for horizontal surface, and ASTM C920, Type M grade NS class 25 for vertical surface greater than 3% slope.

C. Bond breaker shall be an adhesive-backed glazed butyl or polyethylene tape.

2.07 WATERSTOPS (NOT USED)

2.08 BONDING MATERIALS

A. The concrete bonding agent shall be an aqueous-phase, film-forming, non-oxidizing, freeze- and thaw-resistant compound agent suitable for brush or spray application conforming to ASTM C932.

B. Epoxy adhesive binder shall be two-component, epoxy-polysulfide polymer-type bind with amine-type curing agent conforming to ASTM C881/C881M, Type II.

2.09 VAPOR BARRIER

A. Vapor barrier shall be clear polyethylene sheeting, 6-mil conforming to ASTM D2103 or D4397.

2.10 GROUT

A. Non-shrink, cementitious grout shall comply with ASTM C1107/C1107M, Grade B or C.

B. Non-shrink, epoxy machinery grout shall conform to ASTM C827/C827M with compressive strength of 12,000 psi in 7 days.

C. Concrete grout shall have a compressive average strength of 3,000 psi at 29 days. Synthetic fiber reinforcing fibers shall be added to the grout mix at rate of 1.5 pounds of fiber per cubic yard of grout.

PART 3 EXECUTION

3.01 REINFORCING STEEL

A. Reinforcement shall be accurately fabricated to the dimensions shown. Bars shall be bent around a pin having a diameter not less than that recommended in ACI 318. All bars shall be bent cold.

B. Reinforcement shall be shipped to the work with bars of the same size and shape fastened in bundles with metal identification tags giving size and mark securely wired on. The identification tags shall be labeled with the same designation as shown on submitted bar schedules and shop drawings.

C. All bars shall be stored off the ground and shall be protected from moisture and be kept free from dirt, oil, or injurious coatings. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

D. Tension lap splices shall be provided at all laps in compliance with ACI 318. All bar splices shall be staggered wherever possible. When splicing bars of different diameters, the length of lap is based on the larger bar. Class B splices shall be used at all locations unless otherwise indicated on the Drawings.

E. Before being placed in position, reinforcement shall be thoroughly cleaned of loose mill and rust scale, dirt, and other coatings that reduce or destroy bond. Where there is delay in depositing concrete after reinforcement is in place, bars shall be reinspected and cleaned when necessary.

F. Reinforcement that is to be exposed for a considerable length of time after being placed shall be painted with a heavy coat of cement grout, if required.

G. In no case shall any reinforcing steel be covered with concrete until the number and position of the reinforcements have been checked by the Engineer and his/her permission given to proceed with the concreting.

3.02 MECHANICAL COUPLER SYSTEM

A. Use mechanical reinforcing steel coupling system only where indicated. Install in accordance with the manufacturer's written instructions and as specified in this Section.

B. Upon receiving the coupler system, obtain the threaded length for the male ends and sample each lot for variation in thread length on male ends. Record the amount of actual thread (per lot).

C. After formwork is removed, confirm cap is in position (female end).

D. Before installing the male end, remove screwed cap and confirm that the female end (coupler) is clean and free of concrete splatter, dirt, burrs, or other matter which may foul threads.

E. Tighten the dowel bar male end until the threads are fully engaged and no threads are exposed. Do not strip threads.

F. Visually inspect all splice locations. A correctly installed splice will show no exposed threads on the threaded splice bars.

3.03 CONCRETE MIXING AND TRANSPORTING

A. Concrete shall be ready-mixed concrete produced by equipment acceptable to the Engineer. No hand mixing will be permitted. Clean each transit mix truck drum and reverse drum rotation before the truck proceeds under the batching plant. Equip each transit mix truck with a continuous, nonreversible, revolution counter showing the number of revolutions at mixing speeds.

B. Ready mix concrete shall be transported to the site in watertight agitator or mixer trucks loaded not in excess of their rated capacities as stated on the name plate.

C. Keep the water tank valve on each transit truck locked at all times. Any addition of water must be directed by the Engineer. Added water shall be incorporated by additional mixing of at least 35 revolutions. All added water shall be metered and the amount of water added shall be shown on each delivery ticket.

D. All central plant and rolling stock equipment and methods shall comply with ACI 318 and ASTM C94/C94M.

E. Select equipment of size and design to ensure continuous flow of concrete at the delivery end. Metal or metal-lined non-aluminum discharge chutes shall be used and shall have slopes not more than 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 feet long and chutes not meeting slope requirements may be used if concrete is discharged into a hopper before distribution.

F. Re-tempering (mixing with or without additional cement, aggregate, or water) of concrete or mortar which has reached initial set will not be permitted.

G. Handle concrete from mixer to placement as quickly as practicable while providing concrete of required quality in the placement area. Dispatch trucks from the batching plant so they arrive at the work site just before the concrete is required, thus avoiding excessive mixing of concrete while waiting or delays in placing successive layers of concrete in the forms.

H. Furnish a delivery ticket for ready-mixed concrete to the Engineer as each truck arrives. Each ticket shall provide a printed record of the weight of cement and each aggregate as batched individually. Use the type of indicator that returns for zero punch or returns to zero after a batch is discharged. Clearly indicate the weight of fine and coarse aggregate, cement, and water in each batch; the quantity delivered; the time any water is added; and the numerical sequence of the delivery. Show the time of day batched and time of discharge from the truck. Indicate the number of revolutions of the truck mixer.

I. Temperature and Mixing Time Control

1. In cold weather, do not allow the as-mixed temperature of the concrete and concrete temperatures at the time of placement in the forms to drop below 40°F.

2. If the water or aggregate has been heated, combine the water with aggregate in the mixer before cement is added. Do not add cement to mixtures of water and aggregate when the temperature of the mixture is greater than 90°F.

3. In hot weather, cool ingredients before mixing to maintain temperature of the concrete below the maximum placing temperature of 90°F. If necessary, substitute well-crushed ice for all or part of the mixing water.

4. The maximum time interval between adding mixing water and/or cement to the batch and placing concrete in the forms shall not exceed the values shown in Table 2.

TABLE 2
MAXIMUM TIME TO DISCHARGE OF CONCRETE

Air or Concrete Temperature (whichever is higher)	Maximum Time
80 to 90°F (27 to 32°C)	45 minutes
70 to 79°F (21 to 26°C)	60 minutes
40 to 69°F (5 to 20°C)	90 minutes

J. If an approved high-range water-reducer (plasticizer) is used to produce plasticized concrete, the maximum time interval shall not exceed 90 minutes.

3.04 CONCRETE APPEARANCE

A. Concrete mix showing either poor cohesion or poor coating of the coarse aggregate with paste shall be remixed. If this does not correct the condition, the concrete shall be rejected.

B. Concrete for the work shall provide a homogeneous structure which, when hardened, will have the required strength, durability, and appearance. Mixtures and workmanship shall be such that concrete surfaces, when exposed, will require no finishing. When concrete surfaces are stripped, the concrete when viewed in good lighting from 10 feet away shall be pleasing in appearance and at 20 feet shall show no visible defects.

3.05 PLACING CONCRETE

A. Reinforcement, where required, shall be accurately placed in the exact positions shown, shall be secured against displacement with annealed iron wire ties or suitable clips at intersections, and shall have a clear space of 2 inches between the steel and face of forms unless otherwise indicated. Wire ties passing through the forms to hold the steel in proper position will not be allowed. Concrete blocks with wire ties cast in them may be used where approved by the Engineer to maintain the clearance between reinforcement and forms. Reinforcing bars shall be free from rust, scale, dirt, grease, and injurious contaminants.

B. No concrete shall be placed until the Engineer has approved forms and method of placement. Before concrete is deposited, all debris, foreign matter, dirt, and water shall be removed from the forms. The surface of concrete previously placed, such as manhole bases or horizontal construction joints, shall be cleaned and brushed with cement paste. Concrete shall not be placed in water or submerged within 24 hours after placing, nor shall running water be permitted to flow over the surface of fresh concrete within 4 days after its placing.

C. Deposit concrete as near its final position as possible to avoid segregation due to rehandling or flowing. Pumping of concrete will be permitted when an approved design mix and aggregate sizes, suitable for pumping, are used. Do not deposit concrete that has partially hardened or has been contaminated by foreign materials. If the section cannot be placed continuously, place construction joints as specified or as approved. Place concrete for walls using tremie tubes in 12- to 24-inch lifts, keeping the surface horizontal. Do not drop concrete more than 4 feet.

D. High-frequency mechanical vibrators shall be used to the extent necessary to obtain proper consolidation of the concrete. Care shall be taken to avoid segregating aggregates by excessive vibration. Concrete adjacent to forms and around pipe stubs shall be carefully spaded or rodded.

E. Concrete walls shall be deposited in one continuous operation with concrete brought up evenly on all sides. Chutes shall be of metal, "U" shaped, and provided with a baffle plate at the end, if necessary, to prevent segregation of materials. Chutes shall be placed at an angle of not less than 25 degrees, nor more than 45 degrees from horizontal and they shall be kept clean and free from hardened concrete.

F. No concrete shall be mixed or placed during freezing weather without explicit permission. When placing concrete when the air temperature is below 40ºF, heat the water, sand, and gravel so that the temperature of the concrete will be at least 50ºF. This temperature shall be maintained for 72 hours after placing.

3.06 FIELD TESTS

A. The Engineer will take sets of three field control cylinder specimens during the progress of the work, in compliance with ASTM C31/C31M. The number of sets of concrete test cylinders taken of each class of concrete placed each day shall not be fewer than one set nor fewer than one set for each 150 cubic yards of concrete nor fewer than one set for each 5,000 square feet of surface area for slabs or walls. One cylinder shall be broken at 7 days and two cylinders shall be broken and their strengths averaged at 28 days. When the average 28-day compressive strength of the cylinders in any set falls below the specified compressive strength or below proportional minimum 7-day strengths (where the proper relation between 7- and 28-day strengths has been established by tests), the Engineer may reject the concrete represented by the set of cylinders and may require modification of the concrete and/or require modification of the proportions, water content, or temperature conditions of the design mix to achieve the required strengths.

B. The Contractor shall cooperate in testing by allowing free access to the work for selecting samples, providing an insulated closed curing box for specimens, protecting the specimens against injury or loss through his/her operations, and furnishing material and labor required for taking concrete cylinder samples. All shipping of specimens will be paid for by the Owner.

C. Slump tests will be made in the field by the Engineer in conformity with ASTM C143/C143M.

D. Tests for air content shall be made in compliance with either the pressure method complying with ASTM C231/C231M or by the volumetric method complying with ASTM C173/C173M.

3.07 FORMED SURFACES

A. Forms shall remain in-place for the time specified in ACI MCP-4. Do not remove forms and shores until the concrete has gained sufficient strength to support its weight and superimposed loads.

B. Exercise care to prevent damaging edges or obliterating the lines of chamfers, rustications, or corners when removing the forms or performing any other work adjacent to such chamfers, rustications, or corners.

C. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete.

D. Rough Form Finish

1. Immediately after stripping forms and before the concrete has changed color, carefully remove all fins and projections.
2. Promptly fill holes left by tie cones and defects as specified.

3.08 FLOORS AND SLABS

A. Floated Finish

1. Machine Floating:

a. Screed slabs with straightedges to the established grades shown on the Drawings. Immediately after final screeding sprinkle a dry cement/sand shake in the proportion of two sacks of Portland cement to 350 pounds of coarse natural concrete sand evenly over the surface at the rate of approximately 500 pounds/1,000 square foot of slab. Do not sprinkle neat, dry cement on the surface.

b. The application of the cement/sand shake may be eliminated at the discretion of the Engineer if the base slab concrete exhibits adequate fattiness and homogeneity and the need is not indicated. When the concrete has hardened sufficiently to support the weight of a power float without the float's digging into or disrupting the level surface, thoroughly float the shake into the surface with a heavy revolving disc-type power compacting machine capable of providing a 200-pound compaction force distributed over a 24-inch-diameter disc.

c. Start floating along walls and around columns and then move systematically across the surface leaving a matte finish.

d. The compacting machine shall be the "Kelly Power Float with Compaction Control" as manufactured by Kelley Industries of SSP Construction Equipment Inc., Pomona, CA or equal. Troweling machines equipped with float (shoe) blades that are slipped over the trowel blades may be used for floating. Floating with a troweling machine equipped with normal trowel blades will not be permitted. The use of any floating or troweling machine which has a water attachment for wetting the concrete surface during finishing will not be permitted.

2. Hand Floating:

a. In lieu of power floating, small areas may be compacted by hand floating. The dry cement/sand shake previously specified shall be used unless specifically eliminated by the Engineer. Screed the slabs with straightedges to the established grades shown on the Drawings. While the concrete is still green but sufficiently hardened to support a finisher and kneeboards with no more than 1/4-inch indentation, wood float to a true, even plane with no coarse aggregate visible. Use sufficient pressure on the wood floats to bring moisture to the surface.

3. Finishing Tolerances:

a. Level slabs to a tolerance of plus or minus 1/8 inch when checked with a 10-foot straightedge placed anywhere on the slab in any direction. Failure to meet the above requirements shall be cause for removal, grinding, or other correction as directed by the Engineer.

B. Broom Finish

1. Screed slabs with straightedges to the established grades indicated on the Drawings. When the concrete has stiffened sufficiently to maintain small surface indentations, draw a stiff bristle broom lightly across the surface in the direction of drainage or, in the case of walks and stairs, perpendicular to the direction of traffic to provide a non-slip surface.

C. Steel Trowel Finish

1. Finish concrete as specified in Article 3.04. Then, hand steel trowel to a perfectly smooth, hard, even finish free from high or low spots or other defects.

D. Concrete Sealer

1. Prepare and seal surfaces indicated on the room finish schedule to receive a sealer as follows:

a. Finish concrete as specified in the preceding paragraphs and in accordance with the Schedule in Article 3.13.
b. Newly Placed Concrete: Surface must be sound and properly finished. Surface is application ready when it is damp but not wet and can no longer be marred by walking workmen.
c. Newly Cured Bare Concrete: Level any spots gouged out by trades. Remove all dirt, dust, droppage, oil, grease, asphalt, and foreign matter. Cleanse with caustics and detergents as required. Rinse thoroughly and allow to dry so that surface is no more than damp and not wet.
d. Aged Concrete: Restore surface soundness by patching, grouting, filling cracks and holes, etc. Surface must also be free of any dust, dirt, and other foreign matter. Use power tools and/or strippers to remove any incompatible sealers or coatings. Cleanse as required following the procedure indicated under cured concrete.
e. Methods: Apply sealer to form a continuous, uniform film by spray, soft bristle pushbroom, long nap roller, or lambswool applicator. Ordinary garden type sprayers, using neoprene hose, are recommended for best results.
f. Applications: For curing only, apply the first coat evenly and uniformly as soon as possible after final finishing at the rate of 200 to 400 square feet per gallon. Apply the second coat when all trades are completed and the structure is ready for occupancy at the rate of 400 to 600 square feet per gallon.
g. To meet guarantee and to seal and dustproof, two coats are required. For sealing new concrete, both coats shall be applied full strength. On aged concrete, when renovating, dustproofing, and sealing, the first coat should be thinned 10 to 15% with reducer in accordance with the manufacturer's directions.

3.09 CONCRETE RECEIVING CHEMICAL HARDENER (NOT USED)

3.10 APPROVAL OF FINISHES

A. All concrete surfaces, when finished, will be examined by the Engineer.

B. Surfaces which in the opinion of the Engineer are unsatisfactory shall be refinished or reworked.

C. After finishing horizontal surfaces, regardless of the finishing procedure specified, the concrete shall be cured in compliance with this Section unless otherwise directed by the Engineer.

1. Interior or Exterior Horizontal Concrete not Requiring Floor Hardener or Sealer: Floated finish. See Paragraph 3.08D.
2. Concrete for Exterior Walks and Interior and Exterior Stairs: Broomed finish perpendicular to direction of traffic. See Paragraph 3.08B.
3. Concrete Slabs On Which Process Liquids Flow or In Contact with Sludge: Steel trowel finish. See Paragraph 3.08C.

3.11 CURING AND PROTECTION

A. The Contractor shall protect all concrete work against injury from the elements and defacements of any nature during construction operations.

B. Curing Methods

1. Curing Methods for Concrete Surfaces: Cure concrete to retain moisture and maintain specified temperature at the surface for a minimum of 7 days after placement. Curing methods to be used are as follows:

a. Water Curing: Keep entire concrete surface wet by ponding, continuous sprinkling, or by covering with saturated burlap. Begin wet cure as soon as concrete attains an initial set and maintain wet cure 24 hours a day.
b. Sheet Material Curing: Cover entire surface with sheet material. Securely anchor sheeting to prevent wind and air from lifting the sheeting or entrapping air under the sheet. Place and secure sheet as soon as initial concrete set occurs.
c. Liquid Membrane Curing: Apply over the entire concrete surface except for surfaces to receive additional concrete. DO NOT place curing compound on any concrete surface where additional concrete is to be placed or where concrete sealers or surface coatings are to be used. Apply curing compound as soon as the free water on the surface has disappeared and no water sheen is visible, but not after the concrete is dry or when the curing compound can be absorbed into the concrete. Application shall be in compliance with the manufacturer's recommendations.

C. Finished surfaces and slabs shall be protected from the direct rays of the sun to prevent checking and crazing.

D. Cold Weather Concreting

1. *Cold weather* is defined as a period when the average daily outdoor temperature drops below 40°F for more than 3 successive days. The average daily temperature shall be calculated as the average of the highest and the lowest temperature during the period from midnight to midnight.

2. Cold weather concreting shall conform to ACI 306.1 and the additional requirements specified in this Section. Temperatures at the concrete placement shall be recorded at 12-hour intervals (minimum).

3. The Contractor shall discuss a cold weather work plan with the Engineer. The discussion shall encompass the methods and procedures proposed for use during cold weather, including the production, transportation, placement, protection, curing, and temperature monitoring of the concrete. The procedures to be implemented upon abrupt changes in weather conditions or equipment failures shall also be discussed. Cold weather concreting shall not begin until the work plan is acceptable to the Engineer.

4. During periods of cold weather, concrete shall be protected to provide continuous warm, moist curing (with supplementary heat when required) for a total of at least 350 degree-days of curing.

    a. *Degree-days* are defined as the total number of 24-hour periods multiplied by the weighted average daily air temperature at the surface of the concrete (e.g., 5 days at an average of 70°F = 350 degree-days).
    b. To calculate the weighted average daily air temperature, sum hourly measurements of the air temperature in the shade at the surface of the concrete taking any measurement less than 50°F as 0°F. Divide the sum thus calculated by 24 to obtain the weighted average temperature for that day.

5. Salt, manure, or other chemicals shall not be used for protection.

6. The protection period for concrete being water cured shall not be terminated during cold weather until at least 24 hours after water curing has been terminated.

E. Hot Weather Concreting

1. *Hot weather* is defined as any combination of high air temperatures, low relative humidity, and wind velocity which produces a rate of evaporation

estimated in accordance with ACI 305R, approaching or exceeding 0.2 pound/square foot/hour).

2. Concrete placed during hot weather shall be batched, delivered, placed, cured, and protected in compliance with the recommendations of ACI 305R and the additional requirements specified in this Section.

    a. Temperature of concrete being placed shall not exceed 90°F and every effort shall be made to maintain a uniform concrete mix temperature below this level. The temperature of the concrete shall be such that it will cause no difficulties from loss of slump, flash set, or cold joints.
    b. All necessary precautions shall be taken to deliver the concrete promptly, to place the concrete promptly upon its arrival at the job, and to provide vibration immediately after placement.
    c. The Engineer may direct the Contractor to immediately cover plastic concrete with sheet material.

3. The Contractor shall discuss with the Engineer a work plan describing the methods and procedures proposed to use for concrete placement and curing during hot weather. Hot weather concreting shall not begin until the work plan is acceptable to the Engineer.

3.12 STRIPPING AND FINISHING CONCRETE

A. Forms shall not be stripped before the concrete has attained a strength of at least 30% of the specified design strength, unless otherwise approved by the Engineer. This is equivalent to approximately "100 day-degrees" of moist curing.

B. Shores shall not be removed until the concrete has attained at least 70% of its specified design strength and also sufficient strength to support safely its own weight and construction live loads.

C. Care shall be exercised to prevent damaging edges or obliterating the lines of chamfers, rustications, or corners when removing the forms or doing any other adjacent work.

D. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete to the satisfaction of the Engineer.

E. As soon as forms have been stripped, remove form ties, if employed, and fill the recess to ensure complete watertightness. Chip out and repair any defects in the surface of the walls in a workmanlike manner. Defective concrete where it occurs shall be cut to a minimum depth of 1 inch, thoroughly roughened, and neat

cement brushed in. The hole shall then be filled with mortar in the proportion of 1 part cement and 2-1/2 parts sand with a minimum of water. Mortar for filling form tie recesses shall be mixed to a slightly damp consistency (just short of "balling"), pressed into the recess until dense, and troweled smooth. Mortar in larger patches shall be applied and allowed to assume a partial set following which it shall be struck off flush with the adjoining surface. Patches shall be kept moist for several days to ensure proper curing.

F. Top surface of slabs shall be screeded to the established grades and shall be a true plane with a tolerance of 1/8 inch when checked with a 10-foot straightedge. The surface shall be finished to give a smooth, hard, even surface free from high or low spots or other defects. Failure to meet the condition shall be cause for removal, grinding, or other correction as directed by the Engineer.

G. Concrete to receive Liner System shall be finished in strict accordance with the manufacturer's recommendations.

3.13 SCHEDULE

A. The following (Table 3) are the general applications for the various concrete classes and design strengths:

TABLE 3
CONCRETE SCHEDULE

Class	Design Strength (psi)	Description
A	2,500	Concrete fill and duct encasement.
B	3,000	Concrete overlay slabs and curbs/pavements.
C	4,000	Slabs on grade, precast lids, and all other structural concrete.
D	5,000	Prestressed concrete.

3.14 MISCELLANEOUS WORK

A. Sleeve steel work required to be set in the concrete forms for attachment of structural and miscellaneous equipment shall be set or installed under this Division. The Contractor shall be fully responsible for the setting of such materials in the forms and shall correct all such materials not installed in a proper location or manner at his own expense.

END OF SECTION

DIVISION 5

METALS

SECTION 05500
METAL FABRICATIONS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes the following:

1. Metal ladders.
2. Ladder safety cages.
3. Metal bollards.
4. Loose bearing and leveling plates.
5. Shelf and relieving angles.
6. Miscellaneous framing and supports.
7. Prefabricated steel building columns.
8. Steel channels for overhead door openings.
9. Stair nosings.
10. Loose steel lintels.
11. Gratings.
12. Access hatches.

B. Products furnished, but not installed, under this Section include the following:

1. Anchor bolts, steel pipe sleeves, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product Data: For the following:

1. Non-slip aggregates and non-slip-aggregate surface finishes.
2. Prefabricated building columns.
3. Metal nosings and treads.
4. Paint products.
5. Grout.

B. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
2. Provide templates for anchors and bolts specified for installation under other Sections.
3. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Verification: For each type and finish of extruded nosing.

D. Mill Certificates: Signed by the manufacturers of stainless-steel sheet certifying that products furnished comply with requirements.

E. Welding certificates.

F. Qualification Data: Florida Professional Engineering Registration certificate.

1.03 WORK SEQUENCE

A. The Contractor shall coordinate the installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to the Project site in time for installation.

B. The Contractor shall coordinate the installation of steel weld plates and angles for casting into concrete that are specified in this Section but required for work of another Section. Deliver such items to the Project site in time for installation.

1.04 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American National Standards Institute (ANSI)

1. ANSI A14.3—Ladders – Fixed – Safety Requirements.

B. American Society for Testing and Materials (ASTM)

1. ASTM A27/A27M—Standard Specification for Steel Castings, Carbon, for General Application.
2. ASTM A36/A36M—Standard Specification for Carbon Structural Steel.
3. ASTM A47/A47M—Standard Specification for Ferritic Malleable Iron Castings.
4. ASTM A48/A48M—Standard Specification for Gray Iron Castings.
5. ASTM A53/A53M—Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
6. ASTM A123/A123M—Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
7. ASTM A153/A153M—Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
8. ASTM A276/A276M—Standard Specification for Stainless Steel Bars and Shapes.
9. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
10. ASTM A489—Standard Specification for Carbon Steel Lifting Eyes.
11. ASTM A500/A500M—Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
12. ASTM A563—Standard Specification for Carbon and Alloy Steel Nuts.
13. ASTM A653/A653M—Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
14. ASTM A666—Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
15. ASTM A780/A780M—Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
16. ASTM A786/A786M—Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
17. ASTM B108/B108M—Standard Specification for Aluminum-Alloy Permanent Mold Castings.
18. ASTM B209—Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
19. ASTM B221—Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
20. ASTM B241/B241M—Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
21. ASTM B633—Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
22. ASTM C1107/C1107M—Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

23. ASTM D1187/D1187M—Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
24. ASTM E488/E488M—Standard Test Methods for Strength of Anchors in Concrete Elements.
25. ASTM F436/F436M—Standard Specification for Hardened Steel Washers.
26. ASTM F593—Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
27. ASTM F594—Standard Specification for Stainless Steel Nuts.
28. ASTM F836M—Standard Specification for Style 1 Stainless Steel Metric Nuts (Metric).
29. ASTM F879—Standard Specification for Stainless Steel Socket Button and Flat Countersunk Head Cap Screws.
30. ASTM F1554—Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
31. ASTM F3125/F3125M—Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1,040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.

C. American Society of Mechanical Engineers (ASME)

1. ASME B18.2.1—Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series).
2. ASME B18.2.3.8M—Metric Hex Lag Screws.
3. ASME B18.6.1—Wood Screws (Inch Series).
4. ASME B18.6.3—Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch Series).
5. ASME B18.6.7M—Metric Machine Screws.
6. ASME B18.21.1—Washes: Helical Spring-Lock, Tooth Lock, and Plain Washers (Inch Series).
7. ASME B18.21.2M—Lock Washers (Metric Series).
8. ASME B18.22.1—Plain Washers.
9. ASME B18.22M—Metric Plain Washers.

D. American Welding Society (AWS)

1. AWS D1.1/D1.1M—Structural Welding Code – Steel.
2. AWS D1.2/D1.2M—Structural Welding Code – Aluminum.
3. AWS D1.3/D1.3M—Structural Welding Code – Sheet Steel.
4. AWS D1.6/D1.6M—Structural Welding Code – Stainless Steel.

E. Environmental Protection Agency (EPA)

1. EPA Method 24—Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings.

F. Federal Regulations (FR)

1. 40 CFR 59—National Volatile Organic Compound Emission Standards for Consumer and Commercial Products.

G. National Association of Architectural Metal Manufacturers (NAAMM)

1. NAAMM MBG 531—Metal Bar Grating Manual.

H. Society for Protection Coatings (SSPC)

1. SSPC-PA1—Shop, Field, and Maintenance Painting of Steel.
2. SSPC-SP6/NACE No. 3—Commercial Blast Cleaning.
3. SSPC-SP10/NACE No. 2—Near-White Blast Cleaning.
4. SSPC-Paint 20—Zinc-Rich Primers Type I Inorganic and Type II Organic.
5. SSPC-Paint 29—Zinc Dust Sacrificial Primer, Performance-Based.
6. SSPC-Zone 1A—Interior, Normally Dry.
7. SSPC-Zone 1B—Exterior, Normally Dry.

I. Specialty Steel Industry of North America (SSINA)

1. SSINA No. 6 Finish—Satin Finish.

1.05 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, Structural Welding Code—Steel.
2. AWS D1.2/D1.2M, Structural Welding Code—Aluminum.
3. AWS D1.3/D1.3M, Structural Welding Code—Sheet Steel.
4. AWS D1.6/D1.6M, Structural Welding Code—Stainless Steel.

1.06 PROJECT REQUIREMENTS

A. Structural Performance of Ladders: The Contractor shall provide ladders capable of withstanding the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.

B. Thermal Movements: Provide exterior metal fabrications that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120°F, ambient; 180°F, material surfaces.

1.07 PROJECT CONDITIONS

A. Field Measurements: The Contractor shall verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on shop drawings.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
2. Provide allowance for trimming and fitting at site.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 Articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include but are not limited to products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include but are not limited to manufacturers specified.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.02 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For metal fabrications exposed to view in the completed

Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.03 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

1. Unless noted otherwise, steel that is not stainless steel shall be galvanized with a G90 coating conforming to ASTM A123/A123M.

B. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666, Type 316L.

C. Stainless-Steel Bars and Shapes: ASTM A276/A276M, Type 316L.

D. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.

E. Steel Pipe: ASTM A53/A53M, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

2.04 ALUMINUM ALLOY PRODUCTS

A. Aluminum Sheet Plates: Conforming to ASTM B209.
B. Aluminum Extrusions: Conforming to ASTM B221.
C. Aluminum Castings: Conforming to ASTM B108/B108M.

2.05 FASTENERS

A. General: For all exterior applications and where fastening aluminum, provide Type 304 stainless-steel fasteners. Provide hot-dipped galvanized fasteners in all other applications in accordance with ASTM A153/A153M unless noted otherwise on the Drawings. Select fasteners for type, grade, and class required.

B. High-Strength Bolts and Nuts: ASTM F3125/F3125M with heavy hex nuts ASTM A563 and hardened carbon-steel washers ASTM F436/F486M.

C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A (Property Class 4.6); with hex nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.

D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, nuts, and flat washers; ASTM F593 for bolts and ASTM F594 for nuts, Alloy Group A4.

E. Stainless Steel Socket Button and Flat Countersunk Head Cap Screws: ASTM F879.

F. Anchor Bolts: ASTM F 1554, Grade 36.

G. Eyebolts: ASTM A489.

H. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).

I. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

J. Wood Screws: Flat head, ASME B18.6.1.

K. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M).

L. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M).

M. Cast-in-Place Anchors in Concrete: Anchors capable of sustaining without failure a load equal to four times the load imposed, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.

1. Threaded or wedge type; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized in accordance with ASTM A153/A153M.

N. Expansion Anchors: Anchor bolt and sleeve assembly with ability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M conducted by a qualified independent testing agency.

1. Material for Anchors in Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633, Class Fe/Zn 5.
2. Material for Anchors in Exterior Locations: Alloy Group (A4) stainless-steel bolts complying with ASTM F593 and nuts complying with ASTM F594 (ASTM F836M).

2.06 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Shop Primers: Provide primers that comply with Division 9, Finishes.

C. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.

1. Use primer with a VOC content of 3.5 pounds/gallon or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Available Products:

a. Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.
b. Carboline Company; Carbozinc 621.
c. ICI Devoe Coatings; Catha-Coat 313.
d. International Coatings Limited; Interzinc 315 Epoxy Zinc-Rich Primer.
e. PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.
f. Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.
g. Tnemec Company, Inc.; Tneme-Zinc 90-97.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

E. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

F. Nonshrink, Metallic Grout: Factory-packaged, ferrous-aggregate grout complying with ASTM C1107/C1107M, specifically recommended by the manufacturer for heavy-duty loading applications.

G. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by the manufacturer for interior and exterior applications.

2.07 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to the greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work true to line and level with accurate angles, surfaces, and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that will be exposed to weather so as to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of the type indicated and coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 inch by 1-1/2 inches with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.08 METAL BOLLARDS

A. Steel Pipe Bollards: Fabricate pipe bollards from Schedule 80 steel pipe. Fill bollards with concrete.

1. Where bollards are indicated to receive push-button controls for door operators, provide necessary cutouts for push-button controls and hole for wire.

B. Fabricate bollards with 3/8-inch-thick steel base plates for bolting to concrete slab. Drill baseplates at all four corners for 3/4-inch anchor bolts.

1. Where bollards are to be anchored to sloping concrete slabs, angle baseplates for plumb alignment of bollards.

C. Fabricate sleeves for bollard anchorage from steel pipe or tubing with 1/4-inch-thick steel plate welded to bottom of sleeve. Make sleeves not less than 8 inches deep and 3/4 inch larger than OD of bollard.

D. Fabricate internal sleeves for removable bollards from Schedule 40 steel pipe or 1/4-inch wall-thickness steel tubing with an OD approximately 1/16 inch less than ID of bollards. Match drill sleeve and bollard for 3/4-inch steel machine bolt.

2.09 MISCELLANEOUS METAL FABRICATIONS

A. Loose Bearing and Leveling Plates: Flat, free from warps or twists, and of the required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.

B. Miscellaneous Framing and Supports

1. Provide steel framing and supports for applications indicated that are not a part of structural steel framework as required to complete the Work.
2. Fabricate units to sizes, shapes, and profiles indicated and required to receive other adjacent construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items.
3. Galvanize miscellaneous framing and supports in all locations.

2.10 FINISHES, GENERAL

A. Comply with NAAMM's *Metal Finishes Manual for Architectural and Metal Products* for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.11 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

1. ASTM A123/A123M, for galvanizing steel and iron products.
2. ASTM A153/A153M, for galvanizing steel and iron hardware.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Exteriors (SSPC Zone 1B) and Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3.
2. Interiors (SSPC Zone 1A): SSPC-SP 10.

C. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1 for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.12 STAINLESS STEEL FINISHES

A. Remove tool and die marks and stretch lines or blend into finish.

B. Dull Satin Finish: SSINA No. 6 Finish.

C. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 EXECUTION

3.01 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

3.02 INSTALLING METAL BOLLARDS

A. Anchor bollards to existing construction with anchor bolts. Provide four 3/4-inch bolts at each bollard, unless otherwise indicated.

1. Embed anchor bolts at least 4 inches in concrete.

B. Anchor bollards in concrete in formed or core-drilled holes not less than 8 inches deep and 3/4 inch larger than OD of bollard. Fill annular space around bollard solidly with nonshrink, nonmetallic grout mixed and placed to comply with the grout manufacturer’s written instructions. Slope grout up approximately 1/8 inch toward bollard.

C. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches above the bottom of the excavation. Place concrete and vibrate or

tamp for consolidation. Support and brace bollards in position until the concrete has cured.

D. Anchor internal sleeves for removable bollards in formed or core-drilled holes not less than 8 inches deep and 3/4 inch larger than OD of sleeve. Fill annular space around internal sleeves solidly with nonshrink, nonmetallic grout; mixed and placed to comply with grout manufacturer's written instructions. Slope grout up approximately 1/8 inch toward internal sleeve.

E. Anchor internal sleeves for removable bollards in place with concrete footings. Center and align sleeves in holes 3 inches above the bottom of the excavation. Place concrete and vibrate or tamp for consolidation. Support and brace sleeves in position until concrete has cured.

F. Place removable bollards over internal sleeves and secure with 3/4-inch machine bolts and nuts. After tightening nuts, drill holes in bolts for inserting padlocks. The Owner will furnish padlocks.

G. Fill bollards solidly with concrete, mounding top surface to shed water.

1. Do not fill removable bollards with concrete.

3.03 INSTALLING BEARING AND LEVELING PLATES

A. The Contractor shall clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean the bottom surface of bearing plates.

B. Set loose leveling and bearing plates on wedges or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if they are protruding cut off flush with the edge of the bearing plate before packing with grout.

1. Use non-shrink, metallic grout in concealed locations where not exposed to moisture; use non-shrink, nonmetallic grout in exposed locations, unless otherwise indicated.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.04 ADJUSTING AND CLEANING

The Contractor shall do the following:

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9, Finishes.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION

DIVISION 9

FINISHES

SECTION 09900
PAINTING AND COATING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes materials for and application of painting and coating systems for the following surfaces:

1. Buried metal.
2. PVC.

B. It does not include coating steel water tanks and reservoirs.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. Submit manufacturer's data sheets showing the following information:

1. Percent solids by volume.
2. Minimum and maximum recommended dry-film thickness per coat for prime, intermediate, and finish coats.
3. Recommended surface preparation.
4. Recommended thinners.
5. Statement verifying that the specified prime coat is recommended by the manufacturer for use with the specified intermediate and finish coats.
6. Application instructions including recommended equipment and temperature limitations.
7. Curing requirements and instructions.

C. Submit color swatches.

D. Submit certificate identifying the type and gradation of abrasives used for surface preparation.

E. Submit material safety data sheets for each coating.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM A780/A780M—Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
2. ASTM C501—Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser.
3. ASTM D520—Standard Specification for Zinc Dust Pigment.
4. ASTM D522/D522M—Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
5. ASTM D1002—Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal).
6. ASTM D2240—Standard Test Method for Rubber Property—Durometer Hardness.
7. ASTM D2697—Standard Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings.
8. ASTM D2794—Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
9. ASTM D3734—Standard Specification for High-Flash Aromatic Naphthas.
10. ASTM D4060—Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
11. ASTM D4138—Standard Practices for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive, Cross-Sectioning Means.
12. ASTM D4258—Standard Practice for Surface Cleaning Concrete for Coating.
13. ASTM D4260—Standard Practice for Liquid and Gelled Acid Etching of Concrete.
14. ASTM D4261—Standard Practice for Surface Cleaning Concrete Masonry Units for Coating.
15. ASTM D4263—Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
16. ASTM D4787—Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates.

17. ASTM D6386—Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
18. ASTM D7091—Standard Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals.
19. ASTM E84—Standard Test Method for Surface Burning Characteristics of Building Materials.

B. American Water Works Association (AWWA)

1. AWWA C203—Coal-Tar Protective Coatings and Linings for Steel Water Pipe.
2. AWWA C209—Tape Coatings for Steel Water Pipe and Fittings.

C. International Concrete Repair Institute (ICRI)

1. ICRI CSP 3-5—Light to Medium-Heavy Shotblast.
2. ICRI CSP 5—Medium-Heavy Shotblast.

D. National Association of Corrosion Engineers International (NACE)

1. NACE No. 6—Surface Preparation of Concrete.
2. NACE SP0188—Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.

E. NSF International (NSF)

1. NSF 61/600—Drinking Water System Components – Health Effects.

F. Steel Structure Painting Council (SSPC)

1. SSPC PA-1—Shop, Field, and Maintenance Coating of Metals.
2. SSPC PA-2—Procedure for Determining Conformance to Dry Coating Thickness Requirements.
3. SSPC SP-1—Solvent Cleaning.
4. SSPC SP-2—Hand Tool Cleaning.
5. SSPC SP-3—Power Tool Cleaning.
6. SSPC SP-5/NACE No. 1—White Metal Blast Cleaning.
7. SSPC SP-6/NACE No. 3—Commercial Blast Cleaning.
8. SSPC SP-7/NACE No. 4—Brush-Off Blast Cleaning.
9. SSPC SP-8—Pickling.

10. SSPC SP-10/NACE No. 2—Near-White Metal Wet Abrasive Blast Cleaning.
11. SSPC SP-11—Power-Tool Cleaning to Bare Metal.
12. SSPC SP WJ-1—Waterjet Cleaning of Metals – Clean to Bare Substrate.
13. SSPC SP WJ-2—Waterjet Cleaning of Metals – Very Thorough Cleaning.
14. SSPC SP WJ-3—Waterjet Cleaning of Metals – Thorough Cleaning.
15. SSPC SP WJ-4—Waterjet Cleaning of Metals – Light Cleaning.

G. U.S. Department of Defense (MIL)

1. MIL-C-18480B—Coating Compound, Bituminous, Solvent, Coal-Tar Base.
2. MIL-DTL-5541F—Chemical Conversion Coatings on Aluminum and Aluminum Alloys.
3. MIL-P-21035B—Paint High Zinc Dust Content, Galvanizing Repair.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 MATERIALS

2.01 PAINTING AND COATING SYSTEMS

The following index lists the various painting and coating systems by service and generic type:

PAINT COATINGS SYSTEM INDEX		
No.	Title	Generic Coating
Buried Metal Coating Systems		
21.	Buried Metal	Epoxy
24.	Buried Metal	Corrosion-resisting grease
PVC Coating System		
41.	PVC, Ultraviolet Exposure or Color Coding	Polyurethane

These systems are specified in detail in the following Paragraphs. For each coating, the required surface preparation, prime coat, intermediate coat (if required), topcoat, and coating thicknesses are described. Mil thicknesses shown are minimum dry-film thicknesses.

A. Buried Metal Coating Systems

1. System No. 21—Buried Metal:

a. Type: High solids Cycloaliphatic Amine epoxy or phenolic epoxy having minimum volume solids of 80% (ASTM D2697).
b. Service Conditions: Buried metal, such as valves, flanges, bolts, nuts, structural steel, and fittings.
c. Surface Preparation: Solvent clean in accordance with SSPC SP-1 to remove contaminants from the surface. Abrasive blast in accordance with SSPC SP-10.
d. Coating System: Apply three or more coats of Ameron 400; Tnemec 104 HS (6.0 to 8.0 mils per coat); ICI Devoe Bar-Rust 233H; Carboline 890LT; Sherwin-Williams Tank Clad HS B62-80 Series/B60V80 Series at 5.0 to 8.0 mils/coat or equal; 30 mils total. Maximum thickness of an individual coating shall not exceed the manufacturer's recommendation.

2. System No. 24—Buried Metal:

a. Type: Corrosion-resisting grease.
b. Service Conditions: Buried metal, such as bolts, bolt threads, tie rods, and nuts.
c. Surface Preparation: Solvent clean in accordance with SSPC SP-1 to remove contaminants from the surface. Power tool clean in accordance with SSPC SP-3 as a minimum. Abrasive blasting in accordance with SSPC-SP-6/NACE No. 3 is preferred.
d. Coating: NO-OX-ID GG-2 as manufactured by Sanchem, Inc. Apply to a minimum thickness of 1/4 inch.

B. PVC Coating System

1. System No. 41—PVC, Ultraviolet Exposure or Color Coding:

a. Type: Epoxy primer with minimum volume solids of 54% and a pigmented polyurethane enamel having a minimum volume solids of 66%.

b. Service Conditions: Color coding of PVC or exposed to sunlight.
c. Surface Preparation: Clean the surface per SSPC SP-1, Solvent Cleaning. Then, lightly abrade the surface with medium-grain sandpaper.
d. Prime Coat: One coat of Tnemec Series N69 Epoxoline; International 7510; Ameron 385; ICI Devoe Devran 224 HS; Sherwin-Williams Macropoxy 646 B58 Series/B58V600 at 5.0 to 8.0 mils DFT; Carboline 888 or 890; PPG PITT-GUARD® Direct-to-Rust Epoxy Mastic Coating 97-145 Series; or equal. Apply to a minimum dry-film thickness of 4 mils.
e. Finish Coat: One coat of Tnemec Series 1075; International Interthane 990HS; Ameron 450 HS; ICI Devoe Devran 379; Carboline 134 HG; Sherwin-Williams Hi-Solids Polyurethane B65-300 Series/B60V30 at 3.0 to 4.0 mils DFT; PPG PITTHANE® Ultra-Gloss Urethane Enamel 95-812 Series; or equal. Apply to a minimum dry-film thickness of 3 mils.

C. Abrasives for Surface Preparation

1. Abrasives used for preparation of ferrous (excluding stainless steel) surfaces shall be one of the following:

a. 16- to 30- or 16- to 40-mesh silica sand or mineral grit.
b. 20- to 40-mesh garnet.
c. Crushed iron slag, 100% retained on No. 80 mesh.
d. SAE Grade G-40 or G-50 iron or steel grit.

2. Abrasives used for preparation of stainless steel surfaces shall be 20- to 40-mesh silicon carbide or aluminum oxide.

3. Abrasives used for preparation of concrete and masonry surfaces shall be 16- to 30- or 16- to 40-mesh silica sand.

4. In the above gradations, 100% of the material shall pass through the first stated sieve size and 100% shall be retained on the second stated sieve size.

PART 3 EXECUTION

3.01 WEATHER CONDITIONS

A. Do not paint in the rain, wind, snow, mist, or fog or when steel or metal surface temperatures are less than 5°F above the dew point.

B. Do not apply paint when the relative humidity is above 85%.

C. Do not paint when temperature of metal to be painted is above 120°F.

D. Do not apply alkyd, inorganic zinc, silicone aluminum, or silicone acrylic paints if air or surface temperature is below 40°F or expected to be below 40°F within 24 hours.

E. Do not apply epoxy, acrylic latex, and polyurethane paints on an exterior or interior surface if air or surface temperature is below 60°F or expected to drop below 60°F in 24 hours.

3.02 SURFACE PREPARATION PROCEDURES

A. Remove oil and grease from metal surfaces in accordance with SSPC SP-1. Use clean cloths and cleaning solvents and wipe dry with clean cloths. Do not leave a film or greasy residue on the cleaned surfaces before abrasive blasting. Powerwashing with a biodegradable degreaser is also acceptable.

B. Remove weld spatter and weld slag from metal surfaces and grind smoothly rough welds, beads, peaked corners, and sharp edges including erection lugs in accordance with SSPC SP-2 and SSPC SP-3. Grind 0.020 inch (minimum) off the weld caps on pipe weld seams. Grind outside sharp corners, such as the outside edges of flanges, to a minimum radius of 1/4 inch.

C. Do not abrasive blast or prepare more surface area in one day than can be coated in one day; prepare surfaces and apply coatings the same day. Remove sharp edges, burrs, and weld spatter. Prime all areas before rust bloom forms and within the same day.

D. Do not abrasive blast PVC piping or equipment. Do not abrasive blast epoxy- or enamel-coated pipe that has already been factory coated, except to repair scratched or damaged coatings.

E. For carbon steel, do not touch the surface between the time of abrasive blasting and the time the coating is applied. Apply coatings within 2 hours of blasting or before any rust bloom forms.

F. Surface preparation shall conform to the SSPC specifications as follows:

Solvent Cleaning	SP-1
Hand Tool Cleaning	SP-2
Power Tool Cleaning	SP-3
White Metal Blast Cleaning	SP-5
Commercial Blast Cleaning	SP-6

Brush-Off Blast Cleaning	SP-7
Pickling	SP-8
Near-White Blast Cleaning	SP-10
Power Tool Cleaning to Bare Metal	SP-11
Surface Preparation of Concrete	SP-13
Waterjet Cleaning of Metals – Clean to Bare Substrate	SP WJ-1
Waterjet Cleaning of Metals – Very Thorough Cleaning	SP WJ-2
Waterjet Cleaning of Metals – Thorough Cleaning	SP WJ-3
Waterjet Cleaning of Metals – Light Cleaning	SP WJ-4

G. Wherever the words "solvent cleaning," "hand tool cleaning," "wire brushing," or "blast cleaning" or similar words are used in these Specifications or in the paint manufacturer's specifications, they shall be understood to refer to the applicable SSPC (Steel Structure Painting Council), surface preparation specifications listed above.

H. *Dust blasting* is defined as cleaning the surface through the use of very fine abrasives, such as siliceous or mineral abrasives, 80 to 100 mesh. Apply a fine etch to the metal surface to clean the surface of any contamination or oxide and to provide a surface profile for the coating.

I. *Brush-off blasting* of concrete and masonry surfaces is defined as opening subsurface holes and voids and etching the surface for a coating to bond.

J. For carbon steel surfaces, after abrasive blast cleaning, the height of the surface profile shall be 2 to 3 mils. Verify the surface profile by measuring with an impresser tape acceptable to the Owner's Representative. Perform a minimum of one test per 100 square feet of surface area. Testing shall be witnessed by the Owner's Representative. The impresser tape used in the test shall be permanently marked with the date, time, and locations where the test was made. Test results shall be promptly presented to the Owner's Representative.

K. Do not apply any part of a coating system before the Owner's Representative has reviewed the surface preparation. If coating has been applied without this review, if directed by the Owner's Representative, remove the applied coating by abrasive blasting and reapply the coat in accordance with this Specification.

3.03 ABRASIVE BLAST CLEANING

A. Use dry abrasive blast cleaning for metal surfaces. Do not use abrasives in automatic equipment that have become contaminated. When shop or field blast cleaning with handheld nozzles, do not recycle or reuse blast particles.

B. After abrasive blast cleaning and before coating is applied, dry clean surfaces to be coated by dusting, sweeping, and vacuuming to remove residue from blasting.

Apply the specified primer or touch-up coating within an 8-hour working day. Do not apply coating over damp or moist surfaces. Reclean any blast-cleaned surface not coated within the 8-hour period before applying primer or touch-up coating.

C. Keep the area of the work in a clean condition and do not permit blasting particles to accumulate and constitute a nuisance or hazard.

D. During abrasive blast cleaning, prevent damage to adjacent coatings. Schedule blast cleaning and coating so that dust, dirt, blast particles, old coatings, rust, mill scale, etc., will not damage or fall upon wet or newly coated surfaces.

3.04 COATING STAINLESS STEEL

A. Solvent clean in accordance with SSPC SP-1. Solvents and cleaning solutions shall contain less than 200 mg/L of halogens. Then abrasive blast to give a surface profile of 2.0 to 3.0 mils. Refer to the coatings for the correct surface profile. Use coatings that are low in chloride content.

B. Do not apply inorganic zinc primers to stainless steel if such primers are specified in the painting system required. Apply only the intermediate and finish coats in such cases.

3.05 PROCEDURES FOR ITEMS HAVING SHOP-APPLIED PRIME COATS

A. After applying primer to surfaces, allow coating to cure for a minimum of 2 hours before handling to minimize damage.

B. When loading for shipment to the project site, use spacers and other protective devices to separate items to prevent damaging the shop-primed surfaces during transit and unloading. If wood spacers are used, remove wood splinters and particles from the shop-primed surfaces after separation. Use padded chains or ribbon binders to secure the loaded items and minimize damage to the shop-primed surfaces.

C. Cover shop-primed items 100% with protective coverings or tarpaulins to prevent deposition of road salts, fuel residue, and other contaminants in transit.

D. Handle shop-primed items with care during unloading, installation, and erection operations to minimize damage. Do not place or store shop-primed items on the ground or on top of other work unless the ground or work is covered with a protective covering or tarpaulin. Place shop-primed items above the ground upon platforms, skids, or other supports.

3.06 PAINTING SYSTEMS

A. All materials of a specified painting system, including primer, intermediate, and finish coats, shall be produced by the same manufacturer. Thinners, cleaners, driers, and other additives shall be as recommended by the paint manufacturer for the particular coating system.

B. Deliver paints to the jobsite in the original, unopened containers.

3.07 PAINT STORAGE AND MIXING

A. Store and mix materials only in areas designated for that purpose by the Owner's Representative. The area shall be well ventilated, with precautionary measures taken to prevent fire hazards. Post "No Smoking" signs. Storage and mixing areas shall be clean and free of rags, waste, and scrapings. Tightly close containers after each use. Store paint at an ambient temperature from 50°F to 100°F.

B. Prepare multiple-component coatings using all of the contents of the container for each component as packaged by the paint manufacturer. Do not use partial batches. Do not use multiple-component coatings that have been mixed beyond their pot life. Provide small quantity kits for touch-up painting and for painting other small areas. Mix only the components specified and furnished by the paint manufacturer. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.

3.08 PROCEDURES FOR THE APPLICATION OF COATINGS

A. Conform to the requirements of SSPC PA-1. Follow the recommendations of the coating manufacturer, including the selection of spray equipment, brushes, rollers, cleaners, thinners, mixing, drying time, temperature and humidity of application, and safety precautions.

B. Stir, strain, and keep coating materials at a uniform consistency during application. Power mix components. For multiple component materials, premix each component before combining. Apply each coating evenly, free of brush marks, sags, runs, and other evidence of poor workmanship. Use a different shade or tint on succeeding coating applications to indicate coverage where possible. Finished surfaces shall be free from defects or blemishes.

C. Do not use thinners unless recommended by the coating manufacturer. If thinning is allowed, do not exceed the maximum allowable amount of thinner per gallon of coating material. Stir coating materials at all times when adding thinner. Do not flood the coating material surface with thinner before mixing. Do not reduce

coating materials more than is absolutely necessary to obtain the proper application characteristics and to obtain the specified dry-film thicknesses.

D. Remove dust, blast particles, and other debris from blast cleaned surfaces by dusting, sweeping, and vacuuming. Allow ventilator fans to clean airborne dust to provide good visibility in working area before applying coating. Remove dust from coated surfaces by dusting, sweeping, and vacuuming before applying succeeding coats.

E. Apply coating systems to the specified minimum dry-film thicknesses as determined in accordance with SSPC PA-2.

F. Apply primer immediately after blast cleaning and before any surface rusting occurs, or any dust, dirt, or any foreign matter has accumulated. Before applying coating, re-clean surfaces that have surface colored or become moist by blast cleaning.

G. Apply a brush coat of primer on welds, sharp edges, nuts, bolts, and irregular surfaces before applying the primer and finish coat. Apply the brush coat before and in conjunction with the spray coat application. Apply the spray coat over the brush coat.

H. Before applying subsequent coats, allow the primer and intermediate coats to dry for the minimum curing time recommended by the manufacturer. In no case shall the time between coats exceed the manufacturer's recommendation.

I. Each coat shall cover the surface of the preceding coat completely and there shall be a visually perceptible difference in applied shade or tint of colors.

J. Applied coating systems shall be cured at 75°F or higher for 48 hours. If temperature is lower than 75°F, curing time shall be in accordance with printed recommendations of the manufacturer, unless otherwise allowed by the Owner's Representative.

K. Assembled parts shall be disassembled sufficiently before painting or coating to ensure complete coverage by the required coating.

3.09 SURFACES NOT TO BE COATED

A. Do not paint the surfaces listed below unless otherwise noted in the drawings or in other Specification sections. Protect the following surfaces during the painting of adjacent areas:

1. Concrete walkways.

2. Stainless steel.
3. Metal letters.
4. Glass.
5. Fencing.
6. Electrical fixtures except for factory coatings.
7. Nameplates.
8. Grease fittings.
9. Buried pipe, unless specifically required in the piping specifications.

3.10 PROTECTION OF SURFACES NOT TO BE PAINTED

A. Remove, mask, or otherwise protect hardware, lighting fixtures, switch plates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be painted. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process. Mask openings in motors to prevent paint and other materials from entering the motors.

3.11 SURFACES TO BE COATED

A. The exact coating to be applied in any location is not designated by the descriptive phrases in the coating system titles such as “corrosive environment,” “buried metal,” or “submerged metal.” Coat surfaces with the specific coating systems as described below:

1. Coat mechanical equipment, such as pumps as described in the various mechanical equipment specifications. The color of the finish coat shall match the color of the connecting piping.
2. Coat aboveground and exposed piping or piping in vaults and structures as described in the various piping specifications as shown in the Piping Schedule in the drawings. The color of the finish coat shall be as shown in the Piping Schedule in the drawings.
3. Coat valves as described in the various valve specifications. Aboveground valves, or valves in vaults and structures, shall match the color of the connecting piping.
4. Coat concrete surfaces where shown in the drawings.
5. Coat buried flanges, nuts and bolts, valves, flexible pipe couplings, exposed rebar in thrust blocks, and valve boxes as specified in the particular specifications for the above items. Coat buried bolt threads, tie bolt threads, and nuts as specified in System No. 24.

3.12 DRY-FILM THICKNESS TESTING

A. Measure coating thickness specified for carbon steel surfaces with a magnetic-type dry-film thickness gauge in accordance with SSPC PA-2. Provide certification that the gauge has been calibrated by a certified laboratory within the past 6 months. Provide dry-film thickness gauge as manufactured by Mikrotest or Elcometer.

B. Test the finish coat of metal surfaces (except zinc primer and galvanizing) for holidays and discontinuities with an electrical holiday detector, low-voltage, wet-sponge type. Provide measuring equipment. Provide certification that the gauge has been calibrated by a certified laboratory within the past 6 months. Provide detector as manufactured by Tinker and Rasor or K-D Bird Dog.

C. Check each coat for the correct dry-film thickness. Do not measure within 8 hours after application of the coating.

D. For metal surfaces, make five separate spot measurements (average of three readings) spaced evenly over each 100 square feet of area (or fraction thereof) to be measured. Make three readings for each spot measurement of either the substrate or the paint. Move the probe or detector a distance of 1 to 3 inches for each new gauge reading. Discard any unusually high or low reading that cannot be repeated consistently. Take the average (mean) of the three readings as the spot measurement. The average of five spot measurements for each such 100 square-foot area shall not be less than the specified thickness. No single spot measurement in any 100-square-foot area shall be less than 80% nor more than 120% of the specified thickness. One of three readings which are averaged to produce each spot measurement may underrun by a greater amount as defined by SSPC PA-2.

E. For concrete surfaces, make five separate spot measurements spaced evenly over each 100 square feet of area (or fraction thereof) to be measured. The average of five spot measurements for each such 100-square-foot area shall not be less than the specified thickness. No single spot measurement in any 100-square-foot area shall be less than 80% nor more than 120% of the specified thickness.

F. Perform tests in the presence of the Owner’s Representative.

3.13 REPAIR OF IMPROPERLY COATED SURFACES

A. If the item has an improper finish color or insufficient film thickness, clean and topcoat the surface with the specified paint material to obtain the specified color and coverage. Sandblast or power-sand visible areas of chipped, peeled, or abraded paint, feathering the edges. Then prime and finish the coat in accordance

with the Specifications. The work shall be free of runs, bridges, shiners, laps, or other imperfections.

3.14 CLEANING

A. During the work, remove discarded materials, rubbish, cans, and rags at the end of each day's work.

B. Thoroughly clean brushes and other application equipment at the end of each period of use and when changing to another paint or color.

C. Upon completion of painting work, remove masking tape, tarps, and other protective materials, using care not to damage finished surfaces.

END OF SECTION

DIVISION 15

MECHANICAL

SECTION 15055
PIPING SYSTEMS—GENERAL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Specification describes responsibilities and requirements for piping systems including the following:

1. Labor, materials, tools, equipment, and services to be furnished in accordance with the provisions of the Contract Documents. The materials to be used for the piping systems shown in the Drawings are listed by service in the Piping Schedule, included in the Contract Drawings.
2. Coordination of work with other trades.
3. Furnishing and installing all supplementary or miscellaneous items, appurtenances, and devices incidental to or necessary for a sound, secure, and complete installation, although such work is not specifically indicated.
4. Furnishing Record Drawings and documents for piping systems.

1.02 SUBMITTALS

The Contractor shall submit the following in accordance with Section 01330, Submittals and Acceptance:

A. If the Contractor deviates from the piping layout as shown on the Contract Drawings, the Contractor shall submit scaled piping drawings showing locations and dimensions to and from fittings, valves, tanks, equipment, structures, and related appurtenances. Provide scaled drawings to a minimum scale of 1 inch equals 10 feet. Provide details to minimum scale of 1/8 inch equals 1 foot. Elevations shall correspond to reference vertical elevation datum shown or provided for this project.

B. Copies of any manufacturer's written directions regarding material handling, delivery, storage, and installation.

C. Record piping drawings shall meet the requirements of Section 01785, Record Documents. During the work, the Contractor shall maintain accurate, up-to-date Record Drawings of piping systems installed in the project, including pre-existing piping discovered, relocated, or at locations other than as originally shown on the Drawings. When the work is completed and accepted by the Owner and the Engineer, the Contractor shall submit Record Drawings in accordance with Section 01785, Record Documents. The Contractor shall identify complete

location, elevations, and description of piping systems. Piping systems and fittings are to be identified from three points on structures and/or stationary appurtenances.

D. Submit copies of forms documenting required field pressure testing work and results.

E. Submit welding certificate copies.

F. Submit certified copies of mill test reports for bolts and nuts, including coatings if specified. Provide recertification by an independent domestic testing laboratory for materials originating outside of the United States.

G. Submit manufacturer's data sheet for gaskets supplied showing dimensions and bolting recommendations.

H. Support Systems:

1. Drawings of each piping system locating each support, guide, and anchor.
2. Identify support, guide, and anchor type by catalog number and shop/ contract drawing detail number.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society of Mechanical Engineers (ASME)

1. ASME B1.1—Unified Inch Screw Threads (UN and UNR Thread Form).
2. ASME B1.20.1—Pipe Threads, General Purpose (Inch).
3. ASME B16.21—Nonmetallic Flat Gaskets for Pipe Flanges.
4. ASME B18.2.1—Square, Hex, Heavy Hex, and Askew Head Bolts, and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series).
5. ASME B18.2.2—Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series).
6. ASME B31.1—Power Piping.
7. ASME B31.3—Process Piping.
8. ASME BPVC—Boiler and Pressure Vessel Code.

B. American Society for Testing and Materials (ASTM)

1. ASTM A183—Specification for Carbon Steel Track Bolts and Nuts.
2. ASTM A193/A193MM—Standard Specification for Alloy-Steel; and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
3. ASTM A194/A194M—Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both.
4. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
5. ASTM D1330—Standard Specification for Rubber Sheet Gaskets.
6. ASTM F467—Standard Specification for Nonferrous Nuts for General Use.

C. American Water Works Association (AWWA)

1. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
2. AWWA C207—Steel Pipe Flanges for Waterworks Service, Sizes 4-Inch through 144-Inch (100 mm through 3,600 mm).

D. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS)

1. MSS SP-58—Pipe Hangars and Supports – Material, Design, and Manufacture, Selection, Application, and Installation.

E. NSF International (NSF)

1. NSF 61/600—Drinking Water System Components – Health Effects.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. The Contractor shall protect the pipe from kinks, cuts, end damage, and other defects when transporting all piping. Binding and tie-down methods shall not

damage or deflect the pipes in any way. Pipe damaged during shipment shall be rejected.

C. Pipe shall be stored on level ground, preferably turf or sand, free of sharp objects that could damage the pipe. Stacking of any pipe shall be limited to a height that will not cause excessive deformation of the lower layers of pipe under anticipated temperature conditions. When necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such widths to not allow deformation of the pipe at the point of contact with the sleeper or between supports. Pipe shall not be removed from storage until bedding or sub-grade work is complete and ready to receive the pipe.

D. The joined pipe shall be handled in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. Ropes, fabric, or rubber-protected slings and straps shall be used when handling pipe. Chains, cables, or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe. Pipe or fittings shall not be dropped. Slings for handling joined pipe shall not be positioned at socket-welded joints. Sections of the pipes with cuts and gouges shall be removed and the ends of the pipe rejoined. In accordance with the pipe manufacturer's written instructions, the Contractor shall repair all pipe with damaged linings and pipe exterior coatings that have been damaged before the pipe is installed.

E. The Contractor shall cover all pipe stored on the site with canvas or other opaque material to protect it from sunlight. Provide air circulation under the covering.

F. The Contractor shall inspect all pipe, fittings, and other accessories upon delivery and during the work. Any defective or damaged materials found during field inspection or during tests shall be removed from the site and replaced by, and at the expense of, the Contractor.

G. The interior of all pipe, fittings, and other accessories shall be kept free from dirt and foreign matter at all times. Fittings shall be drained and stored in a manner that will protect them from damage by freezing.

H. Gaskets shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-delivered-to-site and first-to-be-installed rotation basis. Mechanical-joint glands, bolts, and washers shall be handled and stored in a manner that will ensure proper use with respect to types and sizes.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

1.07 DEFINITIONS OF BURIED, EXPOSED, AND SUBMERGED PIPING

A. Buried piping is piping buried in soil, beneath a structure and/or encased in concrete. Where an exterior pipe coating is specified to be factory- or field-applied, the Contractor shall provide the coating up to the penetration of a structure. Piping encased in concrete does not require an exterior coating other than what is factory furnished.

B. Exposed piping is piping in any of the following conditions or locations:

1. Above ground.
2. Inside buildings, vaults, or other structures.
3. In underground concrete trenches or galleries.

C. Submerged piping is considered to be all piping within a liquid holding tank.

1.08 SYSTEM DESIGN REQUIREMENTS

A. General

1. The Specifications and Drawings are not all inclusive of explicit piping details; provide piping for intended use in compliance with laws and regulations, including ASME B31.1 Code (Power Piping).
2. Pressure ratings and materials specified represent minimum acceptable standards for piping systems.
3. Piping Systems: Suitable for the services specified and intended.
4. Piping shall be color coded in accordance with the Department of Environmental Protection requirements.

B. Support Systems

1. The absence of pipe supports and details on the Drawings shall not relieve the Contractor of responsibility for sizing and providing supports for this project.

2. Select and design within the specified spans and component requirements.

3. Comply with requirements of MSS SP-58.

4. Criteria for structural design and selection of pipe support system components:

    a. Dead loads imposed by the weight of the pipes filled with water, within specified spans and component requirements, plus any insulation.
    b. Safety factor: Minimum of 5.

5. Design, size, and space support anchoring devices, including anchor bolts, inserts, and other devices used to anchor the support, to withstand the shear and pullout loads imposed by loading and spacing on each particular support.

    a. Piping smaller than 30 inches: Supports are shown only where specific types and locations are required; additional pipe supports may be required and are to be provided and installed by the Contractor at no additional cost to the Owner.

C. Adapters

1. No attempt has been made to show all adapters, spool pieces, reducers, bushings, or other fittings required to accommodate the connection of pipes, fittings, and valves of various joint design and sizes throughout the project. The Contractor is completely responsible for providing, at his expense, all adapters, reducers, sleeves, spool pieces, and other fittings and appurtenances necessary for connection of pipe (for the same pipe material of or a transition of pipe materials), valves, fittings, and appurtenances throughout the project, which shall be constructed of appropriate materials, coated and lined to match the materials, coatings, and linings specified for the connected components. All adapters, reducers, sleeves, spool pieces, and other fittings shall be coated and lined in accordance with the specifications for each individual pipe system.

D. Unions

1. No attempt has been made to show all unions required for the project. The Contractor shall provide unions at all connections of threaded pipe to installed equipment unless deleted by the Engineer, in writing, at certain locations. The unions shall meet or exceed the quality of materials, pressure rating, service, and painting requirements of connected piping.

PART 2 PRODUCTS

2.01 PIPING SYSTEM GENERAL REQUIREMENTS SCHEDULE

A. Unless noted otherwise in the Drawings, piping system materials, fittings, and appurtenances are subject to requirements of the individual Specifications for the piping systems.

2.02 PIPING SCHEDULE

A. A piping schedule (flow stream identification) listing the piping identification abbreviations, piping materials, operating pressures, field test pressures, lining systems, and color coding associated with the flow streams is provided on the Contract Drawings. In project locations where the piping system material referenced on the piping schedule is not appropriate, the required piping material is indicated on the Contract Drawings. Materials called out in the Contract Drawings shall govern over materials stated in the piping schedule.

2.03 THREAD FORMING FOR STAINLESS STEEL BOLTS

A. Form threads for stainless steel bolts by rolling, not by cutting or grinding.

2.04 BOLTS AND NUTS FOR FLANGES FOR DUCTILE IRON PIPE FLANGES

A. Bolts, washers, and nuts for pipe installed indoors, outdoors above and below ground, and in vaults and structures shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.

B. Bolts, washers, and nuts for submerged Class 150 flanges shall be Type 304 stainless steel conforming to ASTM A193/A193M (Grade B8) for bolts and ASTM A194/A194M (Grade 8) for nuts. Fit shall be Class 2A conforming to ASME B1.1 when connecting to cast-iron valves having body bolt holes.

2.05 BOLTS AND NUTS FOR TYPE 304 STAINLESS STEEL PIPE FLANGES

A. Bolts, washers, and nuts for flanges shall be Type 304 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

2.06 BOLTS AND NUTS FOR TYPE 316 STAINLESS STEEL PIPE FLANGES

A. Bolts, washers, and nuts for flanges shall be Type 316 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

2.07 BOLTS AND NUTS FOR PVC, CPVC, AND PVDF PIPE FLANGES

A. Bolts for piping in sodium hypochlorite service shall be made of titanium, in accordance with ASTM F467, Grade Ti1, Ti2, or Ti7. Nuts and washers shall conform to ASTM F467 and shall be made of titanium.

B. Bolts, washers, and nuts in chemical service other than sodium hypochlorite shall be Type 304 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

C. Bolts, washers, and nuts for buried and submerged flanges and flanges located outdoors above ground or in vaults and structures shall be Type 304 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

D. The Contractor shall provide a washer under each nut and under each bolthead. Washers shall be of the same material as the nuts.

2.08 BOLTS AND NUTS FOR STEEL PIPE FLANGES

A. Bolts, washers, and nuts for Class 150 flanges (including AWWA C207, Class D) located indoors, outdoors above ground, in vaults, and in structures shall be carbon steel, ASTM A307, Grade B. Bolts, washers, and nuts for buried service shall also be hot-dipped galvanized.

B. Bolts, washers, and nuts for submerged Class 150 flanges shall be Type 304 stainless steel conforming to ASTM A193/A193M (Grade B8) for bolts and ASTM A194/A194M (Grade 8) for nuts. Fit shall be Class 2A in accordance with ASME B1.1 when connecting to cast-iron valves having body bolt holes.

2.09 LUBRICANT FOR STAINLESS STEEL BOLTS AND NUTS

A. Anti-seize thread lubricant shall be applied to the thread portion of all (above grade and below grade) stainless steel bolts (stainless steel tie rods, etc.) during assembly. Anti-seize lubricant shall be chloride free and shall be nongalling NSF approved. Anti-seize thread lubricant shall be Jet-Lube “Nikal,” John Crane “Thred Gard Nickel,” Never-Seez “Pure Nickel Special,” or Permatex “Nickel Anti-Seize.”

2.10 FLANGE GASKETS FOR STEEL, DUCTILE IRON, AND STAINLESS STEEL PIPE

A. Flange gaskets shall be in accordance with AWWA C207, except as modified in this Section. Gaskets shall be ring type. All gasket material shall be suitable for

the fluid being conveyed and shall be resistant to free chlorine concentrations up to 10 mg/L. All gasket material shall be rated to the surge pressures listed in the pipe schedule. Gaskets shall be EPDM, Viton, or an approved equal.

2.11 FLANGE GASKETS FOR DUCTILE-IRON PIPE AND FITTINGS IN RAW SEWAGE

A. Gaskets shall be full face, 1/8 inch thick, Buna-N having a Brinell Hardness of 55 to 65 durometer. Gaskets shall be suitable for a water pressure of 200 psi at a temperature of 250°F. Gaskets shall have "nominal" pipe size inside diameters, not the inside diameters indicated in ASME B16.21. Provide Garlock Style 9122 or equal. The Contractor shall verify that the gaskets are compatible with all chemicals being used.

2.12 FLANGE GASKETS FOR PVC AND CPVC PIPE

A. Gaskets for flanged joints shall be full faced, 1/8 inch thick, having a Brinell Hardness of 50 to 70 durometer A. Gasket material shall be EPR unless noted or specified otherwise. Gasket material for sodium hypochlorite service shall be Viton ETP unless noted or specified otherwise. Gaskets shall be compatible with the fluids conveyed.

2.13 FLANGE GASKETS FOR PVDF PIPE

A. Gaskets for flanged joints shall be full faced, 5/64 inch thick (minimum), made of Teflon-bonded EPDM or PVDF-bonded EPDM. The EPDM shall have a Brinell Hardness of 65 to 70 Durometer “A.” Gaskets shall be suitable for a fluid temperature range of -40˚F to +210˚F and compatible with the fluids conveyed.

2.14 FLANGE GASKETS FOR STAINLESS STEEL PIPE IN CHEMICAL SERVICE

A. Gaskets shall be suitable for a maximum pressure of 300 psi and a maximum temperature of 500°F. The Contractor shall verify that the gaskets are compatible with the fluids conveyed. Gaskets for chemical service shall be one of the following materials:

1. Teflon-envelope type, full face, 1/8 inch thick, with compressed nonasbestos filler. Provide free-flow design in which the Teflon is machined or milled between leaves to provide a space for the filler.
2. Teflon (PTFE) with inert filler, 1/8 inch thick. Product: Garlock "Gylon 3510" shall be used for potassium hydroxide, sodium hypochlorite, and ammonium hydroxide. Garlock “Gylon 3545” shall be used for sulfuric acid, corrosion inhibitor, and hydrofluosilicic acid.

2.15 POTABLE WATER PIPING SYSTEMS

A. All potable water piping systems including pipe, valves, fittings, weld-solvents, linings, gaskets, lubricants, grout disinfection agents, and surfaces in contact with potable water shall meet all local and State of Florida regulations and requirements including NSF 61/600. The Contractor shall coordinate the color of the potable water system piping color with the Owner's color standard and shall provide color as approved by the Owner.

2.16 LOCATOR WIRE (OR DETECTABLE PIPELINE MARKING TAPE)

A. All 2-inch and larger buried piping shall be laid with two insulated, 12-gauge minimum AWG, THWN strand copper wires taped with adhesive-backed tape or tied to the nonmetallic pipe at 5 feet on center for location purposes.

PART 3 EXECUTION

3.01 PREPARATION

A. Field Alignment

1. The piping shown on the Contract Drawings is generally indicative of the work, with symbols and notations provided for clarity. However, the Contract Drawings are not an exact representation of all conditions involved; therefore, install piping to suit actual field conditions and measurements as approved by the Engineer. No extra compensation will be made for work due to differences between indicated and actual dimensions.
2. The Contractor shall install all adapters, fittings, flanged connections, closures, restrained joints, etc. not specified but necessary for a complete installation acceptable to the Engineer.
3. The Contract Drawings do not indicate all adapters, fittings, spool pieces, bushings, unions, supports, hangers, and other items required to accommodate the installing and connecting of pipe, fittings, valves, and equipment of various joint designs and sizes. Provide such required items of appropriate designs, materials, coatings, and linings.
4. An extensive network of underground piping, duct, conduit, direct-buried conductors, and related structures of various sizes, materials, alignments, age, and function exist within the project site. Conclusive information concerning these facilities is not available. Consequently, the design of new piping indicated on the Contract Drawings is approximate. Adjust alignment, fitting, valve, and joint locations as required and as approved by the Engineer to accommodate and protect existing facilities and provide the intended functionality of new piping.

3.02 FIELD LAYOUT AND MODIFICATIONS

A. Unless directed otherwise, the Contractor shall be responsible for setting construction layout stakes and/or offsets required to complete the designated work. The Contractor shall ensure that those stakes and/or offsets are protected and any re-staking required for any reason including work stoppage shall be included in the bid price and no additional compensation to the Contractor will be made.

B. The Engineer has the right to make any modifications the Engineer deems necessary due to field conditions, conflicts with other utilities, or to protect other properties.

3.03 PIPE PRODUCTS INSPECTION

A. The Contractor shall obtain from the pipe manufacturer a certificate of inspection to the effect that the pipe, fittings, gaskets, glands, bolts, and nuts supplied for this Contract have been inspected at the plant and that they meet the requirements of these Specifications. The Contractor shall submit these certificates to the Engineer before installing the pipe materials. The Contractor shall visually inspect all pipe and fittings at delivery and before they are lowered into the trench to be installed. Pipe or fittings that do not conform to these Specifications or have been damaged in any manner will be rejected and the Contractor must remove them immediately. The entire product of any plant may be rejected when, in the opinion of the Engineer, the methods or quality assurance and uniformity of manufacturer fail to secure acceptable and uniform pipe products or where the materials used produce inferior pipe products.

3.04 REMOVAL OF EXISTING PIPE AND FITTINGS

A. Pipe specifically identified on the Drawings to be removed or replaced from service shall be physically taken out of the ground. The limits of pipe to be removed shall be specifically called for in the plans or shall be approved in writing by the Engineer. Any other removal not specifically called for shall be approved in writing and shall be considered incidental to construction of other items in the contract and the Contractor will not receive compensation for such work.

B. When removing pipe the Contractor shall excavate a trench wide enough to dislodge the pipe from the surrounding soil and long enough to be able to handle the pipe without causing any damage to nearby utilities, structures, or adjacent property.

C. The removed pipe, fitting, and appurtenances will become the Contractor's property and the Contractor shall be responsible for proper disposal and any required permits for disposal.

D. Regarding pipe remaining in the ground subsequent to removal of connected pipe or pipe fittings, the remaining buried pipes, openings, and fittings shall be plugged or capped as approved by the Engineer.

E. Pipe that will be abandoned in place shall be plugged or capped as approved by the Engineer.

3.05 BURIED PIPING AND PIPE FITTINGS

A. Trenching and backfilling for all pipe and fittings shall also be in accordance with Section 02305, Earthwork for Utilities.

B. Installation

1. Inspect all piping for defects and remove all lumps or excess coatings before installation. The inside of the mechanical joint and outside of plain-end pipe shall be cleaned before joining pipe. Caution shall be taken to prevent damage to the pipe during lowering into the trench. Remove all foreign matter that has entered the pipe during storage and installation. The Contractor shall cover the pipe ends during installation to prevent debris from entering the pipe. No debris, tools, clothing, or other material shall be placed in the pipe.
2. After being placed in the trench, the pipe shall be brought to the proper line and grade by compacting the approved backfill material under it, except at the bell end. Joint deflection shall not exceed 75% of the manufacturer's limit.
3. The Contractor shall install temporary water-tight plugs on the pipe ends during the time that the pipe is in the trench but no work is in progress. If there is water in the trench upon beginning work, this plug shall remain in place until the trench has been pumped dry, unless otherwise approved by the Engineer, the Engineer’s Representative, or the Owner’s Representative.
4. Buried carbon steel bolts and nuts shall be coated in accordance with the manufacturer’s recommendations.
5. Coat threaded portions of stainless steel bolts and nuts with lubricant before assembly.
6. Restrained plugs or caps shall be inserted into all buried dead end pipes, tees, or crosses. Provide blind flanges for all flanged exposed piping. Restrained plugs and caps installed for pressure testing shall be fully secured and blocked to withstand the test pressure.

7. Where plugging is required because of contract division or phasing for later connection, the ends of such lines shall be equipped with a suitable cast-iron or ductile-iron plug/cap or blind flange with or without a blowoff cock, as shown on the Drawings. Installation or removal of such plugging shall be considered incidental to the work and the Contractor shall not be compensated by the Owner for performing this work.

3.06 FLANGED JOINTS FOR EXPOSED PIPE AND FITTINGS

A. When bolting flanged joints, the Contractor shall avoid restraint on the opposite end of the pipe or fitting, which would prevent uniform gasket compression or which would cause unnecessary stress in the flanges. One flange shall be free to move in any direction while the flange bolts are being tightened. Bolts shall be tightened gradually and at a uniform rate to ensure uniform compression of the gasket, in accordance with pipe and fitting manufacturer's recommendations.

B. Coat threaded portions of stainless steel bolts and nuts with lubricant before assembly.

3.07 PIPING CONNECTIONS TO PUMPS AND OTHER EQUIPMENT

A. When connecting to pumps and equipment, the Contractor shall ensure that piping stresses are not transmitted to the pump and equipment. All connecting pipe shall be permanently supported and aligned so that accurate matching of bolt holes and uniform contact over the entire surface of pump flanges are obtained before any bolts are installed in the flanges or pipe is threaded into pump and equipment. In addition, pump connection piping shall be free to move parallel to its longitudinal center line while the bolts are being tightened.

1. Pumps and equipment shall be leveled, aligned, and wedged into a position that will fit the connecting pipe, but shall not be grouted until the initial fitting and alignment of the pump and equipment may be shifted on its foundation if necessary to properly install the connecting pipe. Each pump and piece of equipment shall, however, be grouted before final bolting of the connecting piping.
2. After final alignment and bolting, the pump and equipment connections shall be tested for applied piping stresses by loosening the flange bolts which, if the piping is properly installed, should result in no movement of the piping relative to the pump or opening of the pump connection joints. If any movement is observed, the piping shall be loosened and re-aligned as required and then the flanges bolted back together. The flange bolts then shall be loosened and the process repeated until no movement is observed.

3. All carbon steel bolts and nuts shall be coated with the same exterior coating applied to the piping system.

3.08 ANCHORING AND RESTRAINING

A. Thrust blocks shall be used in new lines and shall be limited to areas in which a new fitting has been installed in an existing line and field restraining joints are not feasible or when directed by the Engineer.

3.09 FLUSHING, CLEANING, TESTING, AND INSPECTION OF PIPING

A. See Section 15144, Pressure Testing of Piping, for the requirements of pipe flushing, cleaning, pressure testing, and inspection requirements.

3.10 DISINFECTION

A. See Section 15141, Disinfection of Piping and Water Storage Facilities, for the disinfection requirements.

3.11 SPECIAL REQUIREMENTS AND PIPING SPECIALTIES

A. Welding

1. Use only certified welders meeting procedures and performance outlined in Section IX of the ASME BPVC and other codes and requirements in accordance with local building and utility requirements. Submit Welder's certificates to the Engineer for the project record before beginning any welding on the project. The Welder must be certified for all positions (flat, vertical, and overhead).
2. Have all welds conform to highest industrial practice in accordance with ASME B31.1 and ASME B31.3 or other codes and requirements in accordance with local building and utility requirements.

3.12 PIPE COLOR CODING

A. The pipe color shall be as identified on the Drawings. The Contractor shall coordinate with the Engineer and the Owner to generate a list of acceptable pipe colors for exposed piping systems. On applicable pipes, the color shall be in accordance with FDEP color-coding requirements.

END OF SECTION

SECTION 15075
PROCESS EQUIPMENT, PIPING, AND VALVE IDENTIFICATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes requirements for materials and installation of markers, labels, and signs for pipes, and valves; for mechanical equipment; for hazardous materials warnings.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. The Contractor shall submit manufacturer's catalog data and descriptive literature describing materials, colors, letter size, and size of labels.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in the Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American National Standards Institute (ANSI)

1. ANSI Z535.1—Safety Colors.

B. American Society of Mechanical Engineers (ASME)

1. ASME A31.1—Scheme for Identification of Piping Systems.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 LABELS FOR PIPING

A. Labels for piping shall bear the full piping system name as shown in the Piping Schedule on the Drawings. The Contractor shall provide separate flow directional arrows next to each label. Color, size, and labeling shall conform to ASME A13.1 and ANSI Z535.1. Labels for piping inside buildings shall be vinyl cloth: W.H. Brady Co. B-500 vinyl cloth, Seton Name Plate Corporation Pipe Markers, or equal. Labels for piping located outdoors shall be weather- and UV-resistant acrylic plastic and shall be W. H. Brady Co. B-946, Seton Name Plate Corporation Pipe Markers, or equal.

B. Alternatively, the Contractor shall provide preprinted, semirigid, snap-on, color-coded pipe markers. Color, size, and labeling shall conform to ASME A13.1 and ANSI Z535.1. Label shall cover 360º (minimum). Labels shall be fabricated of weather- and UV-resistant acrylic plastic. Labels shall be Seton Nameplate Corporation SetMark pipe marks or equal.

2.02 LABELS FOR VALVES

A. The Contractor shall provide each valve listed on the Tag Number list with an identification tag. The tag shall be 2-inch-square or circular aluminum or 1/16-inch-thick fiberglass: W. H. Brady B-60, Seton Name Plate Corp. Series SVT, or equal. Aluminum tags shall have black-filled letters. The tag shall show the valve name.

2.03 HOSE BIBB SIGNS—UNSAFE WATER

A. The Contractor shall provide a rigid sign labeled "DANGER--UNSAFE WATER" for each hose bibb. Size and lettering shall conform to OSHA requirements. Signs shall be Seton Nameplate Company 20-gauge baked enamel, minimum size 7 inches by 3 inches; Brady B-120 Fiber-Shield fiberglass, minimum size 7 inches by 3 inches, 1/8 inch thick; or equal.

2.04 LABELS FOR MECHANICAL EQUIPMENT

A. The Contractor shall provide a label for each pump or other piece of mechanical equipment. The label shall show the equipment name and tag number as shown on

the Tag Number list or on the Drawings. Labels shall be 1-1/2 inches (minimum) by 4 inches (minimum) brass, aluminum, or 1/8-inch-thick fiberglass tags.

2.05 UNDERGROUND PLASTIC WARNING TAPE FOR PIPE

A. The Contractor shall provide permanent, bright-colored, continuous-printed plastic tape intended for direct burial service, not less than 6 inches wide by 3.5 mils thick. Provide tape with printing that most accurately indicates the type of service of buried pipe. Provide the following colored tape for the various piping services:

Service	Color
Cable TV	Orange
Gas	Yellow
Electric	Red
Telephone	Orange
Water	Blue
Sewer	Green
Chemical	Yellow
Reclaimed Water	Violet

2.06 UNDERGROUND DETECTABLE METALLIC PIPE WARNING TAPE

A. The Contractor shall provide permanent, bright-colored, continuous-printed tape consisting of an aluminum or steel foil sheathed in a plastic laminate, not less than 3 inches wide by 5 mils thick. Provide tape with printing that most accurately indicates the type of buried service. Provide the following colored tape for the various piping services:

Service	Color
Cable TV	Orange
Gas	Yellow
Electric	Red
Telephone	Orange
Water	Blue
Sewer	Green
Chemical	Yellow
Reclaimed Water	Violet

PART 3 EXECUTION

3.01 INSTALLING PIPE LABELS

A. The Contractor shall provide a label and flow arrow at each connection to pumps or other mechanical equipment, at wall boundaries, at tees and crosses, and at 20-foot centers on straight runs of piping.

B. On piping having external diameters less than 6 inches (including insulation, if any), the Contractor shall provide full-band pipe markers, extending 360º around pipe at each location.

C. On piping having external diameters of 6 inches and larger (including insulation, if any), provide either full-band or strip-type pipe markers but not narrower than three times letter height (and of required length), fastened by one of the following methods:

1. Laminated or bonded application of pipe marker to pipe or insulation.
2. Strapped-to-pipe or insulation application of semirigid type with Type 304 or 305 stainless steel bands.

3.02 INSTALLING VALVE AND EQUIPMENT LABELS

A. The Contractor shall attach labels to the valve or piece of equipment with Type 304 or 316 stainless steel chains unless otherwise noted.

B. The Contractor shall attach valve labels to the valve handwheels. If the valve has no handwheel, attach the label to the valve by tying the tag wire or chain around the operating shaft or nut.

3.03 INSTALLING MISCELLANEOUS SIGNS

A. The Contractor shall attach miscellaneous signs according to the sign manufacturer's recommendations and in accordance with OSHA requirements.

3.04 INSTALLING UNDERGROUND PLASTIC WARNING TAPE FOR PIPE

A. During backfilling of each exterior underground piping system, the Contractor shall install continuous underground-type plastic line marker directly over buried line at 6 to 8 inches above the top of the pipe. Where multiple small lines are buried in a common trench and do not exceed an overall width of 16 inches, install a single line marker.

3.05 INSTALLING UNDERGROUND DETECTABLE METALLIC PIPE WARNING TAPE

A. The Contractor shall install tape 4 to 6 inches below finished ground surface directly over buried pipelines. Where multiple small pipelines are buried in a common trench and do not exceed an overall width of 16 inches, install a single marker tape.

END OF SECTION

SECTION 15110
MANUAL, CHECK, AND PROCESS VALVES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all valves as shown in the Drawings and as specified in this Section. All valves shall be complete with all necessary manual actuators, valve boxes, extension stems, and floor stands, which are required for proper valve operation and completion of the work.

1. All valves shall be of the sizes shown in the Drawings. All equipment of the same type shall be from one manufacturer, unless authorized in writing by the Engineer.

2. The valves shall include but not be limited to the following:

a. Air valves.
b. Ball valves.
c. Gate valves.
d. Plug valves.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product technical submittal data shall contain the following information and data:

1. Acknowledgment that products submitted meet requirements of standards referenced.

2. Manufacturer’s installation instructions.

3. Manufacturer’s operation and maintenance manuals.

4. Data of valves, actuators, and accessories:

a. Pressure and temperature rating.
b. Materials of construction, with ASTM reference and grade.
c. Linings and coatings.

d. Dimensions and weight.
e. Flow coefficient.
f. Actuators and accessories details.
g. Manufacturer's product brochure, cut-sheets, and parts diagrams.

B. Dimensions and orientation of valve actuators as installed on the valves. Show location of internal stops for gear actuators. State differential pressure and fluid velocity used to size actuators. For worm-gear actuators, state the radius of the gear sector in contact with the worm and state the handwheel diameter.

C. The following test reports: Performance Tests; Leakage Tests; Hydrostatic Tests; and Proof-of-Design Tests as applicable or required.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Petroleum Institute (API)

1. API SPEC 6D—Specification for Valves.
2. API STD 6FA—Standard for Fire Test for Valves.
3. API STD 594—Check Valves: Flanged, Lug, Wafer, and Butt-Welding.
4. API STD 607—Fire Test for Quarter-Turn Valves and Valves Equipped with Nonmetallic Seats.

B. American Society for Testing of Materials (ASTM)

1. ASTM A36/A36M—Standard Specification for Carbon Structural Steel.
2. ASTM A47/A47M—Standard Specification for Ferritic Malleable Iron Castings.
3. ASTM A48/A48M—Standard Specification for Gray Iron Castings.
4. ASTM A105/A105M—Standard Specification for Carbon Steel Forgings for Piping Applications.
5. ASTM A108—Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
6. ASTM A126—Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
7. ASTM A148/A148M—Standard Specification for Steel Castings, High Strength, for Structural Purposes.
8. ASTM A181/A181M—Standard Specification for Carbon Steel Forgings, for General-Purpose Piping.

9. ASTM A182/A182M—Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.
10. ASTM A193/A193M—Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications.
11. ASTM A194/A194M—Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
12. ASTM A216/A216M—Standard Specification for Steel Castings, Carbon, Suitable for Fusion-Welding, for High-Temperature Service.
13. ASTM A240/A240M—Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
14. ASTM A269/A269M—Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
15. ASTM A276/A276M—Standard Specification for Stainless Steel Bars and Shapes.
16. ASTM A313/A313M—Standard Specification for Stainless Steel Spring Wire.
17. ASTM A322—Standard Specification for Steel Bars, Alloy, Standard Grades.
18. ASTM A351/A351M—Standard Specification for Castings, Austenitic, for Pressure-Containing Parts.
19. ASTM A395/A395M—Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures.
20. ASTM A436—Standard Specification for Austenitic Gray Iron Castings.
21. ASTM A439/A439M—Standard Specification for Austenitic Ductile Iron Castings.
22. ASTM A449—Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use.
23. ASTM A479/A479M—Standard Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels.
24. ASTM A494/A494M—Standard Specification for Castings, Nickel and Nickel Alloy.
25. ASTM A516/A516M—Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service.
26. ASTM A536—Standard Specification for Ductile Iron Castings.
27. ASTM A564/A564M—Standard Specification for Hot-Rolled and Cold-Finished Age-Hardening Stainless Steel Bars and Shapes.
28. ASTM A582/A582M—Standard Specification for Free-Machining Stainless Steel Bars.

29. ASTM A666—Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
30. ASTM A743/A743M—Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application.
31. ASTM A744/A744M—Standard Specification for Castings, Iron-Chromium-Nickel, Corrosion Resistant, for Severe Service.
32. ASTM A890/A890M—Standard Specification for Castings, Iron-Chromium-Nickel-Molybdenum Corrosion-Resistant, Duplex (Austenitic/Ferritic) for General Application.
33. ASTM B16/B16M—Standard Specification for Free-Cutting Brass Rod, Bar, and Shapes for Use in Screw Machines.
34. ASTM B21/B21M—Standard Specification for Naval Brass Rod, Bar, and Shapes.
35. ASTM B61—Standard Specification for Steam or Valve Bronze Castings.
36. ASTM B62—Standard Specification for Composition Bronze or Ounce Metal Castings.
37. ASTM B98/B98M—Standard Specification for Copper-Silicon Alloy Rod, Bar, and Shapes.
38. ASTM B99/B99M—Standard Specification for Copper-Silicon Alloy Wire for General Applications.
39. ASTM B127—Standard Specification for Nickel-Copper Alloy Plate, Sheet, and Strip.
40. ASTM B148—Standard Specification for Aluminum-Bronze Sand Castings.
41. ASTM B150/B150M—Standard Specification for Aluminum Bronze Rod, Bar, and Shapes.
42. ASTM B164—Standard Specification for Nickel-Copper Alloy Rod, Bar, and Wire.
43. ASTM B169/B169M—Standard Specification for Aluminum Bronze Sheet, Strip, and Rolled Bar.
44. ASTM B193—Standard Test Method for Resistivity of Electrical Conductor Materials.
45. ASTM B371/B371M—Standard Specification for Copper-Zinc-Silicon Alloy Rod.
46. ASTM B427—Standard Specification for Gear Bronze Alloy Castings.
47. ASTM B443—Standard Specification for Nickel-Chromium-Molybdenum-Columbium Alloy and Nickel-Chromium-Molybdenum-Silicon Alloy Plate, Sheet, and Strip.
48. ASTM B446—Standard Specification for Nickel-Chromium-Molybdenum-Columbium Alloy (UNS N06625), Nickel-Chromium-Molybdenum-Silicon Alloy (UNS N06219), and Nickel-Chromium-Molybdenum-Tungsten Alloy (UNS N06650) Rod and Bar.

49. ASTM B462—Standard Specification for Forged or Rolled Nickel Alloy Pipe Flanges, Forged Fittings, and Valves and Parts for Corrosive High-Temperature Service.
50. ASTM B463—Standard Specification for UNS N08020 Alloy Plate, Sheet, and Strip.
51. ASTM B472—Standard Specification for Nickel Alloy Billets and Bars for Reforging.
52. ASTM B584—Standard Specification for Copper Alloy Sand Castings for General Applications.
53. ASTM B763/B763M—Standard Specification for Copper Alloy Sand Castings for Valve Applications.
54. ASTM D1248—Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.
55. ASTM D1784—Standard Classification System and Basis for Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
56. ASTM D1785—Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
57. ASTM D2000—Standard Classification System for Rubber Products in Automotive Applications.
58. ASTM D3222—Standard Specification for Unmodified Poly (Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials.
59. ASTM D4101—Standard Classification System and Basis for Specification for Polypropylene Injection and Extrusion Materials.
60. ASTM F441/F441M—Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.
61. ASTM F467—Standard Specification for Non-ferrous Nuts for General Use.
62. ASTM F468—Standard Specification for Non-ferrous Bolts, Hex Cap Screws, Socket Head Cap Screws, and Studs for General Use.

C. American Society of Mechanical Engineers (ASME)

1. ASME B1.20.1—Pipe Threads, General Purpose (Inch).
2. ASME B1.20.7—Hose Coupling Screw Threads (Inch).
3. ASME B16.1—Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250.
4. ASME B16.5—Pipe Flanges and Flanged Fittings NPS 1/2 through NPS 24 Metric/Inch Standard.
5. ASME B16.10—Face-to-Face and End-to-End Dimensions of Valves.
6. ASME B16.11—Forged Fittings, Socket-Welding and Threaded.
7. ASME B16.18—Cast Copper Alloy Solder Joint Pressure Fittings.
8. ASME B16.24—Cast Copper Alloy Pipe Flanges, Flanged Fittings, and Valve Classes 150, 300, 600, 900, 1500, and 2500.

9. ASME B16.34—Valves – Flanged, Threaded, and Welding End.
10. ASME B16.42—Ductile Iron Pipe Flanges and Flanged Fittings Classes 150 and 300.
11. ASME B16.47—Large Diameter Steel Flanges NPS 26 through NPS 60 Metric/Inch Standard.
12. ASME B36.10M—Welded and Seamless Wrought Steel Pipe.

D. American Society of Safety Engineers (ASSE)

1. ASSE 1011—Performance Requirements for Hose Connection Vacuum Breakers.

E. American Water Works Association (AWWA)

1. AWWA C110/A21.10—Ductile-Iron and Gray-Iron Fittings.
2. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
3. AWWA C115/A21.15—Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
4. AWWA C207—Steel Pipe Flanges for Waterworks Service, Sizes 4-Inch through 144-Inch (100 mm through 3,600 mm).
5. AWWA C500—Metal-Seated Gate Valves for Water Supply Service.
6. AWWA C504—Rubber-Sealed Butterfly Valves.
7. AWWA C507—Ball Valves 6-Inch through 60-Inch (150 mm through 1,500 mm).
8. AWWA C508—Swing-Check Valves for Waterworks Service, 2-Inch through 48-Inch (50 mm through 1,200 mm) NPS.
9. AWWA C509—Resilient-Seated Gate Valves for Water Supply Service.
10. AWWA C512—Air Release, Air/Vacuum, and Combination Air Valves for Water and Wastewater Service.
11. AWWA C515—Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service.
12. AWWA C550—Protective Interior Coatings for Valves and Hydrants.
13. AWWA C606—Grooved and Shouldered Joints.
14. AWWA C800—Underground Service Line Valves and Fittings.

F. Fluid Controls Institute (FCI)

1. ANSI/FCI 70-2—Control Valve Seat Leakage.

G. Manufacturers Standardization Society (MSS)

1. MSS SP-61—Pressure Testing of Valves.
2. MSS SP-67—Butterfly Valves.

3. MSS SP-68—High Pressure Butterfly Valves with Offset Design.
4. MSS SP-81—Stainless-Steel or Stainless-Steel-Lined, Bonnetless, Knife Gate Valves with Flanged Ends.
5. MSS SP-83—Class 3000 Steel Pipe Unions Socket Welding and Threaded (Carbon Steel, Alloy Steel, Stainless Steel, and Nickel Alloy).
6. MSS SP-108—Resilient-Seated Cast Iron Eccentric Plug Valves.

H. National Association of Corrosion Engineers International (NACE)

1. NACE AMPP MR0103—Petroleum, Petrochemical, and Natural Gas Industries – Metallic Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments.
2. NACE AMPP MR0175/ISO15156—Petroleum and Natural Gas Industries – Materials for Use in H2S-Containing Environments in Oil and Gas Production.

I. National Fluid Power Association (NFPA)

1. NFPA T3.6.7—Fluid Power Systems and Products – Square Head Industrial Cylinders – Mounting Dimensions.
2. NFPA T3.6.68—Fluid Power – Square Head Cylinders – Determination of the Static Failure Pressure Rating of Pressure-Containing Components.

J. NSF International (NSF)

1. NSF 61/600—Drinking Water System Components – Health Effects.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. All valves, unless otherwise directed, shall be loaded and unloaded by lifting, and under no circumstances shall valves be dropped, skidded, or rolled. Valves shall not be stacked or placed under pipe, fittings, or other valves in such a manner that damage could result.

C. Slings, hooks, or tongs used for lifting shall be padded in such a manner as to prevent damage to exterior surface or interior linings and valve components. If any part of the coating, lining, or components is damaged, the repairs or replacement shall be made by the Contractor at his expense and in a manner satisfactory to the Engineer before attempting to install such valves.

D. Only new valves will be allowed for installation and shall be stored in a manner to prevent damage and be kept free of dirt, mud, or other debris.

1.06 QUALIFICATIONS

A. All of the valves shall be products of well-established firms which are fully experienced, reputable, have been selling this product for a minimum of 10 years, and are qualified in the manufacture of the particular product furnished. The valves shall be designed, constructed, and installed in accordance with the requirements and procedures of applicable AWWA standards and shall comply with these Specifications as applicable.

1.07 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

1.08 VALVE TYPE CLASSIFICATIONS

A. Air Valves (Type 100 series)

1. Type 125: Combination Air Valves for Water Services, Single Body.
2. Type 140: Air Valves for Sewage Services, Air Release.

B. Ball Valves (Type 200 series)

1. Type 221: Full-Port Threaded Stainless-Steel Ball Valves, 2 Inches and Smaller, for Water Service.
2. Type 231: Full-Port Threaded Carbon-Steel Ball Valves, 2 Inches and Smaller.

C. Gate Valves (Type 600 series)

1. Type 637: Ductile-Iron Resilient Wedge Tapping Gate Valves, 4 Inches through 16 Inches (AWWA C515).
2. Type 682: Cast-Iron Resilient Wedge Gate Valves, 3 Inches through 20 Inches, for Buried Service (AWWA C509).

D. Plug Valves (Type 900 series)

1. Type 920: Cast-Iron Non-Lubricated Eccentric Plug Valves, 4 Inches and Larger.

PART 2 PRODUCTS

2.01 GENERAL

A. Valves are identified in the Drawings by size and type number. For example, a callout of 36V300 refers to a 36-inch-diameter Type 300 valve. A Type 300 valve is a flanged, rubber-seated butterfly valve that is 4 inches through 72 inches for exposed service.

B. All valves shall be complete with all necessary geared actuators, chainwheels and chains, handwheels, levers, valve bonnets, valve boxes, extension stems, operating nuts, and T-handle wrenches, which are required for proper valve operating and completing of the work included under this Section. Renewable parts including discs, packing, and seats shall be of types specified in this Section and acceptable by valve manufacturer for the intended service. All units shall have the name of the manufacturer and the size of the valve cast on the body or bonnet or shown on a permanently attached stainless-steel plate in raised embossed letters. All isolation valves shall be suitable for the intended service with bubble-tight shutoff to flow in either direction.

C. Bronze or brass components in contact with water shall comply with the following requirements:

Constituent	Content
Zinc	7% maximum
Aluminum	2% maximum
Lead	8% maximum
Copper + Nickel + Silicon	83% minimum

D. Valves and valve operators shall be factory prepared and primed and field finish coated in accordance with Section 09900, Painting and Coating.

2.02 VALVE ACTUATORS

A. The valve actuator shall be an integral part of a valve. The valve actuator shall be provided, installed, and adjusted by the valve manufacturer. Actuator mounting arrangements shall facilitate operation and maintenance and shall be determined by the valve manufacturer unless indicated otherwise on the Drawings or directed by the Engineer.

B. All valves shall open counter clockwise as viewed from the top. Unless otherwise required by the Owner, the direction of rotation of the wheel or wrench nut to open each valve shall be to the left (counterclockwise). Each valve body or actuator shall have the word "Open" cast on it and an arrow indicating the direction to open.

C. Actuators shall clearly indicate valve position and an adjustable stop shall be provided to set closing torque. All exposed nuts, bolts, and washers shall be AISI Type 304 stainless steel. Unless noted otherwise, valves shall be equipped with the following manual actuators:

1. Exposed Valves 6 Inches and Smaller: removable lever or handwheel actuators.
2. Exposed Valves 8 Inches and Larger: geared actuators with handwheels.
3. Buried or Submerged Valves 6 Inches and Smaller: 2-inch-square operating nuts (with valve bonnets, valve boxes, and extension stems as required) and T-handle wrench.
4. Buried or Submerged Valves 8 Inches and Larger: Geared actuators with 2-inch-square operating nuts (with valve bonnets, valve boxes, and extension stems as required) and wrench.

D. Levers or handwheels shall be provided to actuate the valves where the valves are within 6 feet and 7 inches from finished grade or the operating floor. Handwheels shall be constructed of ductile-iron. Levers and handwheels shall be coated in accordance with Section 09900, Painting and Coating. Handwheel diameters for traveling nut actuators shall not exceed 8 inches for valves 12 inches and smaller and shall not exceed 12 inches for valves 20 inches and smaller.

E. Chainwheel and guide actuators shall be provided for all exposed valves installed with their centerlines more than 6 feet and 9 inches above finished grade. Chainwheels shall be cast-iron with stainless-steel stem, clip, and pins. The actuating chain shall be AISI Type 304 stainless steel. Stainless-steel chain baskets shall also be provided with these units. Chainwheels shall be coated in accordance with Section 09900, Painting and Coating. Chainwheels and guides shall be Clow Figure F-5680, DeZurik Series W or LWG, Stockham, or equal.

F. Gear actuators for valves 8 inches through 20 inches shall be of the worm-and-gear or of the traveling-nut type. Gear actuators for valves 24 inches and larger shall be of the worm-and-gear type. Gear actuators for motorized valves shall be of the worm-and-gear type, regardless of size.

1. Gear actuators should be designed assuming that the differential pressure across the valves is equal to the test pressure of the connecting piping and

assuming a line fluid temperature range of 33°F to 125°F, unless otherwise required in the detailed valve specifications.

2. Gear actuators shall be enclosed and oil lubricated with seals provided on shafts to prevent entry of dirt and water into the actuator. Gear actuators for valves aboveground or in vaults and structures shall have handwheels. The actuators for valves in exposed service shall contain a dial indicating the position of the valve disc or plug.
3. Traveling nut and worm-and-gear actuators shall be of the totally enclosed design and proportioned to permit operation of the valve under full differential pressure rating of the valve with a maximum pull of 80 pounds on the handwheel or crank. Stop-limiting devices shall be provided in the actuators in the open and closed positions. Actuators shall be of the self-locking type to prevent the disc or plug from creeping. Design actuator components between the input and the stop-limiting devices to withstand without damage a pull of 200 pounds for handwheel or chainwheel actuators and an input torque of 300 foot-pounds for operating nuts when operating against the stops.
4. The self-locking worm gear shall be a one-piece design of gear bronze material (ASTM B427; or ASTM B584, Alloy C86200) that is accurately machine cut. Actuators for eccentric and lubricated plug valves may use ductile-iron gears provided the gearing is totally enclosed with spring-loaded rubber lip seals on the shafts. The worm shall be hardened alloy steel (ASTM A322, Grade G41500 or G41400; or ASTM A148/A148M, Grade 105-85) with thread ground and polished. Support worm-gear shafts at each end by ball or tapered roller bearings. The reduction gearing shall run in a proper lubricant. The handwheel diameter shall be no more than twice the radius of the gear sector in contact with the worm. Worm-gear actuators shall be Limitorque Model HBC, EIM Series W, or equal.

G. For buried or submerged service, provide watertight shaft seals and watertight valve and actuator cover gaskets. Provide totally enclosed actuators designed for buried or submerged service.

H. All buried valves shall have non-rising stems. All buried valves 3 feet below grade or deeper as measured at the valve centerline shall be furnished with an operator stem extension to extend the operating nut within 6 inches from the top of the valve box cover.

2.03 VALVE END CONNECTIONS

A. Provide valve end connections conforming to connected piping and as shown in the Drawings. Generally, all buried valves shall be mechanical joint type end connectors. Exposed valves shall be screwed-end, socket-weld end, or flanged to conform to adjacent exposed connected piping system.

B. Comply with the following standards:

1. Threaded: ASME B1.20.1.
2. Flanged: ASME B16.1 Class 125 unless other noted or AWWA C207.
3. Mechanical (gland) Type: AWWA C111/A21.11.
4. Soldered: ASME B16.18.

C. Nuts, Bolts, and Washers: Wetted or internal to be bronze or stainless-steel. Exposed to be zinc or cadmium-plated.

D. Epoxy Interior Coating: Provide epoxy coating for all interiors of ferrous valve body surfaces in accordance with AWWA C550. Coatings shall be NSF-approved for valves in all potable water piping services. Coatings shall not be required for stainless-steel valve interiors.

2.04 VALVE BOXES

A. All buried valves 2-inch size and larger shall be equipped with a standard cast-iron roadway valve box. Valve boxes shall be of the slip or sliding type with a round lid marked "Water" for potable water valves or “Sewer” for wastewater and a square lid marked “Reclaimed Water” for reclaimed water valves. The box shall be designed to prevent transfer of the surface loads directly to the valve or piping. Valve boxes must have a minimum adjustable range of 12 inches and a minimum inner diameter of 6 inches. All valve boxes and lids shall be produced from grey cast-iron conforming to the latest revision of specification for grey iron castings, ASTM A48/A48M, Class 20A-25A. All castings shall be true and free of holes and shall be cleaned according to good foundry practice, chipped and ground as needed to remove fins and rough places on castings. Valve boxes have to be rated to sustain FDOT H-20 loadings and have a minimum depth of 8 inches. The valve box lid shall fit flush in the top of the box without forcing and shall not rock, tip, or rattle.

B. Provide debris cap as required in the Drawings.

C. Coat buried cast-iron pieces as specified in Section 09900, Painting and Coating, System No. 21 or with fusion-bonded epoxy.

D. Valve boxes shall be as manufactured by Tyler Pipe, Geneco, Star Pipe Products, or equal.

2.05 EXTENSION STEMS

A. Where the depth of the valve is such that its centerline is more than 4 feet below grade, provide operating extension stems to bring the operating nut to a point 6 inches below the surface of the ground and/or box cover. Where the valve is submerged, provide operating extension stems to bring the operating nut to 6 inches above the water surface. Extension stems shall be Type 316 stainless steel, solid core, and shall be complete with 2-inch-square operating nut. The connections of the extension stems to the operating nuts and to the valves shall withstand without damage a pull of 300 foot-pounds.

B. Extension stem diameters shall be as tabulated below:

Valve Size (inches)	Minimum Extension Stem Diameter (inches)
2	3/4
3, 4	7/8
6	1
8	1-1/8
10, 12	1-1/4
14	1-3/8
16, 18	1-1/2
20, 24, 30, 36	1-3/4
42, 48, 54	2

C. Provide buried valves or valves located inside manholes or vaults with valve boxes cast in the manhole or vault roof with a valve position indicator designed to fit standard 5-1/4-inch valve boxes. The indicators shall show valve position and the direction and number of turns required to fully open (or close). All internal gearing shall be sealed. Ship each unit ready for field installation complete with valve box cast-iron adapter, capscrews, guide bushing, position indicator, flexible washer, centering plate, and 2-inch AWWA nut. Valve box and indicator shall be provided by the valve manufacturer. Indicators shall be Westran Position Indicator, Pratt Diviner, or equal.

2.06 FLOOR STANDS

A. When required by the installations, provide floor stands for the operation of valves. Floor stands shall be of the nonrising stem, indicating type, complete with steel extension stems, couplings, handwheels, stem guide brackets, and special yoke attachments as required by the valves and recommended and supplied by the stand manufacturer. Floor stands shall be cast-iron base type: Clow, Figure F-5515; Bingham and Taylor; Stockham; or equal. Handwheels shall turn counterclockwise to open the valves.

B. Provide Type 316 stainless-steel anchor bolts.

C. Provide Type 316 stainless-steel extension stems for valves in exposed service. Provide Type 316 stainless-steel stems for valves in submerged service.

D. Provide adjustable stem guide brackets for extension stems. The bracket shall allow valve stems to be set over a range of 2 to 36 inches from walls. Provide bushings drilled to accept up to 2-inch-diameter stems. Base, arm, and clamp shall be Type 316 stainless-steel. Bushing shall be bronze (ASTM B584, Alloy C86400 or C83600). Bolts, nuts, screws, and washers (including wall anchor bolts) shall be Type 316 stainless steel. Provide slots in the bracket to accept 3/4-inch bolts for mounting the bracket to the wall. Products: Trumbull Industries, Inc., Adjustable Stem Guide or equal.

2.07 BOLTS, NUTS, AND GASKETS FOR FLANGED VALVES

A. Bolts, nuts, and gaskets for flanged valves shall be as described in Section 15055, Piping Systems—General.

2.08 PAINTING AND COATING

A. Coat buried metal valves at the place of manufacture as specified in Section 09900, Painting and Coating, System No. 21.

2.09 AIR VALVES (TYPE 100 SERIES)

A. General Description

1. All valves shall meet or exceed all applicable provisions of the latest revision of AWWA C512. All valves for drinking water services shall comply with NSF 61/600. Design pressure is 150 psig. Valves shall be operable for water temperatures of above freezing to 125°F.
2. All valves shall consist of a float or a float assembly. Valves shall be identified properly in plates attached permanently on the valve body. The body and cover shall be cast-iron ASTM A126, Class B, or ASTM A48/A48M, Class 35. Valves 3 inches and smaller shall have threaded ends. Valves 4 inches and larger shall have flanged ends. Threaded ends shall comply with ASME B1.20.1. Flanges shall comply with ASME B16.1, Class 125. All flanges shall be flat faced.
3. The float shall be Type 304 or 316 Stainless-Steel. For valves with inlet sizes less than 4 inches, the float shall be able to withstand a collapse pressure of 1,000 psig. For inlet sizes 4 inches and larger, the float shall be capable of withstanding collapse pressures of 750 psig. Trim shall be Type 304 or 316 Stainless-Steel. The valve seat shall be of EPDM or other

rubber materials applicable to wastewater and sludge. The valve seat shall be easily removed and replaced in the field.

4. Drain/test ports on all valves with inlet size 1 inch or larger shall have two 1/2-inch NPT minimum plugged ports, one near the bottom of the valve body and the other near the top of the valve. The plug shall be of bronze, ASTM B584, Alloy C83600.

B. Type 125—Combination Air Valves for Water Services, Single Body

1. Type 125 combination air valve for water service shall be 1-inch through 4-inch inlet size. It shall consist of an air and vacuum valve with an air-release valve in a single-body double-orifice arrangement. The valve body and cover shall be constructed of ASTM A126 Class B cast-iron. The body inlet shall be baffled with a Buna-N float cushion. The floats shall be 300 series stainless-steel. The seats shall be Buna-N and provide drop tight shut-off. Valves shall be APCO 140C Series, Val-Matic Model 201C – 204C, or equal.

C. Type 140—Air Valves for Sewage Services, Air Release

1. Type 140 air valves for sewage service shall be A.R.I. Model S-025, or equal.

2.10 BALL VALVES (TYPE 200 SERIES)

A. Type 221—Full-Port Threaded Stainless-Steel Ball Valves, 2 Inches and Smaller, for Water Service

1. Stainless-steel ball valves 2 inches and smaller for water service shall be rated at a minimum pressure of 1,000 psi WOG at a temperature of 100°F. Provide full-port ball and body design. Valve body, ball, and stem shall be Type 316 stainless-steel, ASTM A276/A276M or A351. Seat and seals shall be reinforced PTFE. Valves shall have lever actuators, plastic coated. Valves shall have screwed ends (ASME B1.20.1) and nonblowout stems. Valves shall be Worcester Series 59, Apollo 86A-100 Series, or approved equal.

B. Type 231—Full-Port Threaded Carbon-Steel Ball Valves, 2 Inches and Smaller

1. Carbon-steel ball valves 2 inches and smaller shall be rated at a minimum pressure of 1,000 psi WOG at a temperature of 100°F. Valve body shall be carbon-steel, ASTM A216/A216M, Grade WCB. Ball shall be Type 316 stainless-steel or carbon-steel, chrome, or nickel-plated. Seat and seals shall be reinforced PTFE. Valves shall have lever handle, plastic coated.

Valves shall have screwed ends (ASME B1.20.1) and nonblowout stems. Valves shall be Worcester Series 59, Apollo 83A-140 Series, or approved equal.

2.11 BUTTERFLY VALVES (TYPE 300 SERIES) (NOT USED)

2.12 CHECK VALVES (TYPE 400 SERIES) (NOT USED)

2.13 DIAPHRAGM VALVES (TYPE 500 SERIES) (NOT USED)

2.14 GATE VALVES (TYPE 600 SERIES)

A. Type 637—Ductile-Iron Resilient Wedge Tapping Gate Valves, 4 Inches through 16 Inches (AWWA C515)

1. Valves shall comply with AWWA C515 and the following. Valves shall be of the bolted bonnet type with nonrising stems. Valve stems shall be Type 304 or 316 stainless-steel or cast, forged, or rolled bronze. Stem nuts shall be made of solid bronze. Bronze for internal working parts, including stems, shall not contain more than 2% aluminum nor more than 7% zinc. Bronze shall conform to ASTM B62 or ASTM B584 (Alloy C83600), except that the stem bronze shall have a minimum tensile strength of 60,000 psi, a minimum yield strength of 30,000 psi, and a minimum of 10% elongation in 2 inches (ASTM B584 or B763/B763M, Alloy C87600 or C99500). Body bolts shall be Type 316 stainless-steel. Ends shall be flanged, Class 125, ASME B16.1. One end shall have slotted bolt holes in accordance with AWWA C515, Paragraph 4.4.1.3.4 to fit tapping machines.
2. Provide reduction-thrust bearings above the stem collar. Stuffing boxes shall be O-ring seal type with two rings located in the stem above the thrust collar. Each valve shall have a smooth unobstructed waterway free from any sediment pockets.
3. Valves shall be lined and coated at the place of manufacture with either fusion-bonded epoxy or heat-cured liquid epoxy. Minimum epoxy thickness shall be 8 mil.
4. Manufacturers: Clow, AVK, American Flow Control, Mueller, Waterous, Kennedy, or equal.

B. Type 682—Cast-Iron Resilient Wedge Gate Valves, 3 Inches through 20 Inches, for Buried Service (AWWA C509)

1. Valves 2 inches and larger for buried service operation shall be of cast-iron or ductile-iron body construction and conform to AWWA C509 for resilient seated gate valves. The valve design shall incorporate non-rising

stems and "O" ring stem seals. Valves shall open counterclockwise. Valves shall be designed for bubbletight shutoff to flow in either direction. Before shipment, the valve manufacturer shall test each valve to 200 psi pressure differential in both directions and provide a certificate to the Engineer stating that each valve provided bubbletight shutoff during testing. The valve interior shall be epoxy coated on the entire ferrous surface of the waterway. The valve exterior shall be coated in accordance with Section 09900, Painting and Coating, and encased with polyethylene as specified in this Section for ductile-iron pipe and fittings. Buried valves shall be equipped with standard 2-inch-square operating nuts.

2. Buried valves 2 inches and larger shall have mechanical joint ends, conforming to AWWA C111/A21.11. Valves shall be furnished complete with bolts, nuts, and gaskets.
3. Gate valves shall be manufactured by Mueller, American Flow Control, Kennedy, or approved equal.

2.15 GLOBE AND ANGLE VALVES (TYPE 700 SERIES) (NOT USED)

2.16 PINCH (TYPE 800 SERIES) (NOT USED)

2.17 PLUG (TYPE 900 SERIES)

A. Plug and Seating Design for Eccentric Plug Valves (Type 920): Eccentric plug valves shall comply with MSS SP-108 and the following. Provide a rectangular plug design, with an associated rectangular seat. Provide bidirectional seating design. The valve shall seat with the rated pressure upstream and downstream of the closed plug. Provide geared actuators sized for bidirectional operation.

B. For Type 920 eccentric plug valves, the metallic portion of the plug shall be one-piece design and shall be without external reinforcing ribs which result in a space between the rib and the main body of the plug through which water can pass. Valves shall be repackable without any disassembly of valve or actuator. The valve shall be capable of being repacked while under the design pressure in the open position. Nowhere in the valve or actuators shall the valve shaft be exposed to iron-on-iron contact. Sleeve bearings shall be stainless-steel in valve sizes 20 inches and smaller and bronze or stainless-steel in valve sizes 24 inches and larger. Provide enclosed worm-gear actuators for valves 6 inches and larger.

C. Rubber compounds shall have less than 2% volume increase when tested in accordance with ASTM D471 after being immersed in distilled water at a temperature of 73.4°F ±2°F for 70 hours.

D. Type 920—Cast-Iron Non-Lubricated Eccentric Plug Valves, 4 Inches and Larger

1. Plug valves 4 inches and larger shall be of the non-lubricated eccentric type with resilient faced plugs and shall be furnished with flanges or mechanical-joint end connections to match connecting piping and as shown in the Drawings. Flanged valves shall be 125-pound flanges and faced and drilled to the ASME B16.1, 125-pound standard. Mechanical joint ends shall conform to AWWA C111/A21.11. Valve bodies shall be of ASTM A126 Class B cast-iron. Valves shall be furnished with a welded overlay seat of not less than 90% pure nickel. Seat area shall be raised, with raised surface completely covered with weld to ensure that the plug face contacts only nickel. Screwed-in seats shall not be acceptable. The plug shall have a cylindrical seating surface eccentrically offset from the center of the plug shaft. The interference between the plug face and body seat, with the plug in the closed position, shall be externally adjustable in the field with the valve in the line under pressure. Plugs shall be resilient faced with Hycar (Acrylonitrile-Butadiene) or Buna N, formulated and constructed to be suitable for use with wastewater. Minimum port areas shall be 80% of full pipe flow area. Valves shall have sleeve-type metal bearings and shall be of sintered, oil-impregnated, permanently lubricated Type 316 ASTM. Nonmetallic bearings shall not be acceptable. Valve shaft seals shall be of the multiple V-ring type or U-cup type and shall be externally adjustable and replaceable without removing the bonnet or actuator from the valve under pressure. Valves using O-ring seals or non-adjustable packing shall not be acceptable. All exposed nuts, bolts, springs, washers, and other fasteners shall be 300-series stainless-steel. Valve working pressure ratings shall be a minimum of 150 psi. Each valve shall be given a hydrostatic and seat test with certified copies of proof-of-design test reports as outlined in AWWA C504, Section 5.5. Plug valves shall be DeZurik PEC Series, Henry Pratt Company “Ballcentric” Series, or approved equal.

2.18 SOLENOID VALVES (TYPE 1000 SERIES) (NOT USED)

2.19 OTHER SPECIAL TYPES OF VALVES (TYPE 1100) (NOT USED)

PART 3 EXECUTION

3.01 JOINTS

A. Bolt holes of flanged valves shall straddle the horizontal and vertical centerlines of the pipe run to which the valves are attached. Clean flanges by wire brushing before installing flanged valves. Clean flange bolts and nuts by wire brushing, lubricate threads with oil and graphite, and tighten nuts uniformly and

progressively. If flanges leak under pressure testing, loosen or remove the nuts and bolts, reseat or replace the gasket, reinstall or retighten the bolts and nuts, and retest the joints. Joints shall be watertight.

B. Clean threaded joints by wire brushing or swabbing. Apply Teflon joint compound or Teflon tape to pipe threads before installing threaded valves. Joints shall be watertight.

C. Install lug-type valves with separate hex head machine bolts at each bolt hole and each flange (two bolts per valve bolt hole).

D. Install grooved-end couplings for valves in accordance with Section 15055, Piping Systems—General.

3.02 INSTALLING EXPOSED VALVES

A. Unless otherwise indicated in the Drawings, install valves in horizontal runs of pipe having centerline elevations 4 feet 6 inches or less above the floor with their operating stems vertical. Install valves in horizontal runs of pipe having centerline elevations between 4 feet 6 inches and 6 feet 9 inches above the floor with their operating stems horizontal.

B. Install valves on vertical runs of pipe that are next to walls with their stems horizontal, away from the wall. Valves on vertical runs of pipe that are not located next to walls shall be installed with their stems horizontal, oriented to facilitate valve operation.

3.03 INSTALLING BURIED VALVES

A. Connect the valve, coat the flanges, apply tape wrapping or polyethylene encasement as required on the Drawings, and place and compact the backfill to the height of the valve stem.

B. Place block pads under the extension pipe to maintain the valve box vertical during backfilling and repaving and to prevent the extension pipe from contacting the valve bonnet.

C. Mount the upper slip pipe of the extension in midposition and secure with backfill around the extension pipe. Pour the concrete ring allowing a depression so the valve box cap will be flush with the pavement surface.

D. In streets without concrete curbs and in open areas, install the valve box as for a paved area with concrete curb but include a marker post. Cut the marker post from 4-inch-by-4-inch dense structural grade Douglas fir No. 2 or Southern Pine

No. 2 surfaced on four sides to a length of 5 feet. Chamfer the top. Set the post in concrete, 2 feet into the ground, away from traffic, and to the side of the pipeline. Coat with a seal and finish coat of white alkyd exterior paint. On the side facing the valve, letter in black the word "VALVE" and the distance in feet from the marker post to the valve box cap.

E. Install debris cap as close as possible under the cast-iron cover without interfering with the cover operation. Trim flexible skirt to provide a smooth contact with the interior or the extension pipe.

3.04 INSTALLING EXTENSION STEM GUIDE BRACKETS

A. Install extension stem guide brackets at 6- to 8-foot centers. Provide at least two support brackets for stems longer than 10 feet, with one support near the bottom of the stem and one near the top.

3.05 FIELD COATING BURIED VALVES

A. Coat flanges of buried valves and the flanges of the adjacent piping and the bolts and nuts of flanges and mechanical joints, as specified in Section 09900, Painting and Coating, System No. 24.

B. Wrap buried metal valves 6 inches and larger with polyethylene sheet as specified in Section 15155, Ductile Iron Pipe and Fittings.

3.06 VALVE LEAKAGE AND FIELD TESTING

A. Test valves for leakage at the same time that the connecting pipelines are tested. See Section 15144, Pressure Testing of Piping, for pressure testing requirements. Protect or isolate any parts of valves, actuators, or control and instrumentation systems whose pressure rating is less than the pressure test. Valves shall show zero leakage. Repair or replace any leaking valves and retest.

B. Operate manual valves through three full cycles of opening and closing. Valves shall operate from full open to full close without sticking or binding. Do not backfill buried valves until after verifying that valves operate from full open to full closed. If valves stick or bind or do not operate from full open to full closed, repair or replace the valve and repeat the tests.

C. Test gear actuators through three full cycles from full-open to full-close without binding or sticking. The pull required to operate handwheel- or chainwheel-operated valves shall not exceed 80 pounds. The torque required to operate valves having 2-inch AWWA nuts shall not exceed 150 foot-pounds. If actuators stick or bind or if pulling forces and torques exceed the values stated previously, repair or

replace the actuators and repeat the tests. Operators shall be lubricated in accordance with the manufacturer's recommendations before operating.

WATER SERVICE CARD

Date of Installation _____

Contract Drawing Number_____

Service Line Size (inches) _____
Length of Water Service Line (feet) _____
Meter Size (inches) _____

Name _____
House/Business Address or Location:

_____
_____
_____

Phone # _____

GPS coordinate @ main _____
GPS coordinate @ meter _____
Confirm Photos are attached _____

Installation Foreman _____

Service Layout

Provide a brief sketch of the installed configuration. Indicate lengths, depths of the water service, and show three ties to meter box and to corporation stop:

Depth @ Main (feet) _____
Depth @ stub out (feet) _____

_____ _____
Contractor Signature Resident Observer Signature

(Rev 2 – 15 Oct 2006)

END OF SECTION

SECTION 15121
MISCELLANEOUS PIPE FITTINGS AND ACCESSORIES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section describes requirements for materials and installation of miscellaneous piping specialties, such as quick-connect couplings and flanged coupling adapters.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Submit manufacturer's catalog data and descriptive literature showing dimensions and materials of construction by ASTM reference and grade. Show coatings.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Iron and Steel Institute (AISI)

1. AISI C1012—Specification for Hard-Drawn Low-Carbon Steel.

B. American Society for Testing and Materials (ASTM)

1. ASTM A36/A36M—Standard Specification for Carbon Structural Steel.
2. ASTM A240/A240M—Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
3. ASTM A513/A513M—Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
4. ASTM A536—Standard Specification for Ductile Iron Castings.
5. ASTM A635/A635M—Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Hot-Rolled, Alloy, Carbon, Structural, High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability, General Requirements for.

6. ASTM C219—Standard Terminology Relating to Hydraulic Cement.
7. ASTM D2000—Standard Classification System for Rubber Products in Automotive Applications.

C. American Society of Mechanical Engineers (ASME)

1. ASME B16.1—Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250.
2. ASME SA36—Carbon Steel Shapes, Plates, and Bars of Structural Quality for Use in Riveted, Bolted, or Welded Construction.
3. ASME SA675— Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties (Carbon Steel Middle Ring or Sleeve).

D. American Water Works Association (AWWA)

1. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
2. AWWA C213—Fusion-Bonded Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
3. AWWA C219—Bolted Sleeve-Type Couplings for Plain-End Pipe.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 METALLIC QUICK-CONNECT COUPLINGS

A. Type 6: Quick-connect couplers shall be female-coupler/female-thread type with locking handles. Provide dust plug and security chain with each coupler. Bodies

and locking handles shall be Type 316 stainless steel. The gasket shall be Teflon. Couplers shall be CIVACON Kamlok 633-D/634-A, Evertite Part D/DP, or equal.

B. Type 8: Quick-connect couplers shall be male-adapter/female-thread type. Provide dust cap and security chain with each coupler. Bodies and locking handles shall be Type 316 stainless steel. The gasket shall be Teflon. Adapters shall be CIVACON Kamlock 633-A/634-B, Evertite Part A/DC, or equal.

C. Type 10: Quick-connect couplers shall be male-adapter/hose-shank type. Provide dust cap with each coupler. Bodies and dust caps shall be Type 316 stainless steel. The gasket shall be Teflon. Adapters shall be CIVACON Kamlok 633-E/634-B, Evertite Part C/DC, or equal.

2.02 COUPLINGS FOR METALLIC PIPING

A. General

1. Thrust Ties: The Contractor shall provide thrust ties where shown and where required to restrain the force developed by 12 times the maximum operating pressure specified.

    a. Steel Pipe: Attach with fabricated lugs.
    b. Ductile Iron Pipe: Attach with bell hanger and wedge restraint glands for buried mechanical joint and push-on joint piping; and thrust retention plates and tie-rods, nuts, washers, and bolts for exposed, flanged piping.

2. Exposed Installations: Zinc-plated nuts and bolts. High-strength, low-alloy steel, in accordance with AWWA C111/A21.11, may be substituted for use on cast-iron and ductile-iron couplings.

3. Buried and Submerged Installations: Provide Type 304 stainless steel tie rods, bolts, and nuts and assemble with an anti-galling compound.

4. Steel Middle Rings and Followers: Fusion-bonded epoxy-lined and coated in accordance with AWWA C213.

5. Restrained couplings or other fittings that use set screws, pointed-end screws to penetrate the outside surface of the pipe for restraint are not acceptable.

B. Flexible Couplings: Coupling shall consist of a steel middle ring or sleeve, two steel or malleable iron flange or follower rings, two wedge-shaped resilient gaskets, and a sufficient number of track-head bolts and nuts.

1. Middle Ring or Sleeve: Steel construction, ASTM A513/A513M, ASTM A635/A635M, or ASME SA675 GR60, fabricated in a true circular section and free of surface defect.

2. Follower Rings or Flanges: Steel construction, AISI C1012 or ASME SA36, fabricated in a true circular section and free of surface defect.

3. Bolts and Nuts: Steel bolt, AWWA C111/A21.22.

4. Gaskets: Grade 27 BUNA-S.

5. Shop Paint: Fusion-bonded epoxy coating.

6. Acceptable Manufacturers:

   a. Dresser Manufacturing Division of Dresser Industries, Inc.
   b. Dresser Styles 38 and 138.
   c. Or approved equal.

C. Transition Couplings: Transition Coupling shall consist of a high-strength steel body, two steel or malleable iron flange or follower rings, a wedge shaped resilient gasket, and a sufficient number of follower bolts.

1. Adapter: Steel construction, ASTM A513/A513M, ASTM A635/A635M or ASME SA675 GR60, free of surface defect.

2. Followers: AISI C1012 or ASME SA36.

3. Bolts: AWWA C 111/ANSI A21.11.

4. Gasket: Grade 27 BUNA-S.

5. Shop Paint: Fusion-bonded epoxy coating.

6. Acceptable Manufacturers:

   a. Dresser Manufacturing Division of Dresser Industries, Inc.; Dresser Styles 62 and 162.
   b. Or approved equal.

D. Flanged Coupling Adapters: Adapters shall consist of a cast-iron or high-strength steel body, two steel or ductile-iron follower rings, a wedge shaped resilient gasket, and a sufficient number of follower bolts.

1. 3- through 12-inch DIP Flange Adapters

a. Adapter: Ductile iron construction, ASTM A536, Grade 65-45-12, free of surface defect. Adapter shall be rated to 200 psi working pressure in accordance with AWWA C219, and -20°F to 212°F.

b. Flanges: Ductile iron construction, ASTM A536, Grade 65-45-12, free of surface defect. Bolt circles and bolt holes shall match those of ASME B16.1 Class 125 flanges.

c. Bolts and nuts: Corrosion-resistant alloy bolts and nuts.

d. Gasket: Grade 27 BUNA-S.

e. Shop paint: fusion-bonded powder epoxy coating.

f. Acceptable Manufacturers:

(1) Dresser Manufacturing Division of Dresser Industries, Inc.; Dresser Style 127.
(2) Or Equal.

2.03 BOLTED SPLIT-SLEEVE AND SINGLE- POINT CLOSURE COUPLINGS

A. Bolted, split-sleeve, and single-point closure couplings shall meet the materials and performance conforming to AWWA C219, which shall be used for steel pipe and stainless steel pipe.

B. When the connecting piping is carbon steel, the coupling shall be manufactured from ASTM A36/A36M carbon steel. When the connecting piping is stainless steel, the coupling shall be manufactured from ASTM A240/A240M Type 316/316L stainless steel.

C. The coupling shall be of the split type with a single-point closure coupling. Provide welded restraint rings on the pipe ends for end restraint. As the coupling closes, it shall confine an elastomeric o-ring type gasket on each pipe end to create a radial seal. The axial seal shall be affected at the closure plates as bolts pull the coupling snug round the pipe.

D. The coupling manufacturer shall provide the restraint rings for each coupling. The Contractor's fabricator shall weld the restraint rings to the pipe in strict accordance with the coupling manufacturer's recommendations.

E. For water service, the elastomeric o-ring type gaskets shall be EPDM (or other material accepted by the Engineer) conforming to ASTM D2000 for the design pressure for the temperature range of -20°F to 180˚F.

F. Type C201 shall be a shouldered, bolted, split-sleeve, fully restrained coupling. Type C201 coupling shall be Depend-O-Lok F x F (Fixed x Fixed), Type 2 manufactured by Victaulic, Depend-O-Lok, Inc., or approved equal.

G. Type C202 shall be a shouldered, bolted, split-sleeve, fully restrained coupling that allows angular deflection of the connecting pipes. Type C202 coupling shall be Depend-O-Lok F x F (Fixed x Fixed), Type 2, Modified manufactured by Victaulic, Depend-O-Lok, Inc., or approved equal.

PART 3 EXECUTION

3.01 INSTALLING QUICK-CONNECT COUPLINGS

A. Attach to piping in accordance with the relevant piping specification.

3.02 INSTALLING COUPLINGS

A. Pipe for use with flexible couplings shall have plain ends as specified in the respective pipe sections in Division 15, Mechanical.

B. Alloy steel bolts and nut for flanged joints shall be made with high-strength, low-alloy Cor-Ten bolts, nuts, and washers. Cor-Ten for mechanical joints shall be made with mild corrosion resistant alloy steel bolts and nuts. All exposed bolts shall be painted the same color as the pipe. All joints to be wrapped with 8-mil color-coded poly wrap.

C. Before sleeve-type couplings are installed, the pipe ends shall be cleaned thoroughly for a distance of 8 inches. Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6 inches from the end, and the middle ring shall be placed on the substantial completion date unless otherwise requested by the Owner.

D. Mechanical joints shall be made in the standard manner. Valve stems shall be vertical in all cases. Set cast-iron box as shown on the Drawings. Boxes shall have sufficient bracing to maintain alignment during backfilling. Knobs on cover shall be parallel to pipe. Remove any sand or undesirable fill from valve box after

installation. Extend tracing wire outside of valve box extension pipe and enter at valve box.

E. Thoroughly clean oil, scale, rust, and dirt from the pipe to provide a clean seat for the gasket.

F. Wipe gaskets clean before installations.

G. Lubricate flexible couplings and flanged coupling adapter gaskets with soapy water or manufacturer's standard lubricant before installing on the pipe ends.

H. Install couplings, service saddles, and anchor studs in accordance with the manufacturer's instruction.

I. Tighten bolts progressively, drawing up bolts on opposite sides a little at a time until all bolts have a uniform tightness.

J. Use torque-limiting wrenches to tighten bolts to the manufacturer's specified torque values.

END OF SECTION

SECTION 15125
PIPING APPURTENANCES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all piping appurtenances as shown on the Drawings and as specified in this Section.

B. All piping appurtenances shall be of the size shown on the Drawings. All equipment of the same type shall be from one manufacturer, unless authorized in writing by the Engineer.

C. All piping appurtenances shall have the name of the manufacturer and the working pressure for which they are designed cast in raised letters upon the body.

D. The piping appurtenances shall include, but not be limited to, the following:

1. Tapping Saddles.
2. Tapping Sleeves and Valves.
3. Pressure Gauge Assembly.
4. Fire Hydrant.
5. Water Meter.
6. Strainers.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product technical submittal data shall contain the following information and data:

1. Acknowledgment that products submitted meet requirements of standards referenced.

2. Manufacturer’s installation instructions.

3. Expansion joints, flexible joints, couplings, adaptors, tapping sleeves, and other appurtenances:

a. Pressure and temperature rating.

b. Materials of construction.
c. Linings.
d. Dimensions and weight.
e. Accessories.
f. Manufacturer's product brochures, cut-sheets, and parts diagrams.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Iron and Steel Institute (AISI)

1. AISI Type 304L—Stainless Steel.
2. AISI Type 316—Stainless Steel, Annealed Sheet.

B. American Society for Testing and Materials (ASTM)

1. ASTM A536—Standard Specification for Ductile Iron Castings.
2. ASTM C285—Standard Test Methods for Sieve Analysis of Wet-Milled and Dry-Milled Porcelain Enamel.

C. American Society of Mechanical Engineers (ASME)

1. ASME B16.5—Pipe Flanges and Flanged Fittings NPS 1/2 through NPS 24 Metric/Inch Standards.

D. American Water Works Association (AWWA)

1. AWWA C105/A21.5—Polyethylene Encasement for Ductile-Iron Pipe Systems.
2. AWWA C153/A21.53—Ductile-Iron Compact Fittings.
3. AWWA C207—Steel Pipe Flanges for Waterworks Service, Sizes 4-Inch through 144-Inch (100 mm through 3,600 mm).
4. AWWA C210—Liquid-Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
5. AWWA C213—Fusion-Bonded Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
6. AWWA C500—Metal-Seated Gate Valves for Water Supply Service.
7. AWWA C502—Dry-Barrel Fire Hydrants.

8. AWWA C700—Standard for Cold-Water Meters—Displacement Type, Metal Alloy Main Case.
9. AWWA C800—Underground Service Line Valves and Fittings.

E. National Sanitation Foundation (NSF)

1. NSF 61—Drinking Water System Components – Health Effects.

1.04 DELIVERY, HANDLING, AND STORAGE

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. All piping appurtenances, unless otherwise directed, shall be loaded and unloaded by lifting, and under no circumstances shall any piping appurtenances be dropped, skidded, or rolled.

C. Slings, hooks, or tongs used for lifting shall be padded to prevent damage to exterior surface or interior linings of piping appurtenances. If any part of the coating, lining, or components is damaged, the Contractor shall make repairs or replacement at his expense and in a manner satisfactory to the Engineer before attempting to install such piping appurtenances.

D. Only new piping appurtenances will be allowed for installation and shall be stored to prevent damage and be kept free of dirt, mud, or other debris.

1.05 QUALIFICATIONS

A. All of the piping appurtenances shall be products of well-established firms that are fully experienced, reputable, have been selling this product for a minimum of 10 years, and qualified in the manufacture of the particular product furnished. The piping appurtenances shall be designed, constructed, and installed in accordance with the requirements and procedures of applicable AWWA standards and shall comply with these Specifications as applicable.

PART 2 PRODUCTS

2.01 TAPPING SADDLE

A. Saddle body shall be made of malleable iron, ductile iron, or bronze. Malleable iron and ductile iron shall be epoxy or nylon coated. Saddles shall be of the single- or multiple-strap design (multiple straps are required for sizes 10 inches and above). The straps shall be made from Type 304 stainless steel or bronze. The

straps shall have a nominal width of 2 inches. Strap studs shall be made from AISI Type 304L stainless steel.

B. Nuts and washers shall be made from Type 304 stainless steel and shall be treated to prevent galling. The straps shall have a curvature accurately formed to meet the diameter of the pipe on which the service saddle is to be installed. A Neoprene gasket shall be securely glued to or imbedded in the body of the clamp to ensure positive sealing against the pipe. Outlet sizes of 3/4 inch and 1 inch shall have female C.C. thread while the outlet for 1-1/2 inches and 2 inches shall be female I.P. thread.

C. Tapping saddles shall not be used on HDPE due to expansion and contraction problems unless specifically approved in writing by the Engineer on a case-by-case basis.

2.02 TAPPING SLEEVES AND VALVES

A. Tapping sleeves and valves shall be designed for a minimum water working pressure of 150 psi and shall be tested at 300 psi. The design shall allow for the insertion of bolts from either side and the internal seal is to be the "O-ring" type. The tapping sleeve shall be furnished complete with bolts, nuts, and gaskets.

B. With the exception of the valve ends and other modifications necessary for tapping service, tapping valves shall conform to AWWA C500 and shall be Mueller "No. T-2360" or approved equal. Each tapping valve shall be provided with a flanged inlet end designed, faced, and drilled for attachment to the outlet flange of the tapping sleeve; an outlet end provided with a tapping flange for attachment of a standard drilling machine; and a mechanical-joint-type bell end for connection of the branch main.

C. Tapping sleeves for 4-inch- through 24-inch-diameter pipe shall be epoxy-coated fabricated-steel construction and manufactured to meet material specification ASTM C285 Grade C for the body. The flange shall conform to AWWA C207 Class D and have an ANSI 150-pound drilling and recessed for tapping valve.

D. Tapping sleeves shall be of the flanged outlet type designed for attachment to the flanged inlet end of the tapping valve and shall be provided with mechanical joint ends at each end of the run. Tapping sleeves shall be Mueller "No. H-615" or approved equal.

2.03 PRESSURE-GAUGE ASSEMBLY

A. Pressure-gauge assemblies shall be provided at locations listed below or as shown on the Drawings. All pressure-gauge assemblies shall include a pressure gauge,

AISI Type 316 stainless steel, NPT threaded ball valves for isolation and venting, and sensor piping. Sensor piping tubing and fittings shall be Type 316 stainless steel. The pressure gauge shall be constructed of Type 316 stainless-steel wetted parts and Type 304 stainless-steel case and bayonet ring, adjustable pointer, laminated safety-glass window, glycerin liquid-filled case, 1.5% span accuracy, and shall have a 2.5-inch-diameter dial size, minimum. The pressure gauge shall be as manufactured by WIKA Instrument Corporation, Type LM 233.54, or approved equal.

B. The Contractor shall furnish and install pressure-gauge assemblies with pressure-gauge ranges as follows and/or shown on the Drawings.

2.04 FIRE HYDRANT

A. Fire hydrants shall be in accordance with AWWA C502, for dry barrel-type fire hydrants. Fire hydrants shall meet the following requirements:

Catalogue and maintenance data	Required.
Type of shutoff	Gate.
Size of hydrant (valve opening)	6-inch.
Inlet connection	6-inch, verify with Drawings.
Outlet nozzles	Two 2.5-inch hose and one 4.5-inch pumper.
Outlet nozzle threads	See Note 1.
Direction to open	Counterclockwise.
Stem seals	O-ring.
Outlet nozzle cap chains	Required.
Drain outlet, non-corrodible	Required.
Traffic breakaway body and valve rod	Required.
Working pressure rating	200 psi (minimum).
Fire hydrant wrenches	Provide five wrenches as spare parts.
Nozzle wrenches	Provide five wrenches as spare parts for each size nozzle provided.
Breakaway repair kit	Provide five kits as spare parts.

Notes

1. Outlet nozzle threads shall be the Owner's standard fire hydrant thread. The Contractor shall verify thread type before submittal.

B. Hydrants shall have Underwriter's Laboratory (UL) and Factory Mutual (FM) approvals. Hydrant exteriors shall be painted with one coat of zinc-chromate alkyd primer and two finish coats of approved paint of the color required by the Owner. Hydrant interiors shall be painted with a paint system approved by NSF

for use in potable water. Working parts shall be bronze. All internal parts shall be removable through the top of the hydrant. Hydrants shall conform to NFPA 24.

C. Fire hydrant extensions shall be provided at no additional cost to the Owner to meet final grade requirements. All hydrants shall stand plumb. No portion of the fire hydrant shall be within 6 inches of a sidewalk. After installation, all hydrants shall be inspected, cleaned, and opened and closed as many times as required to verify that all aspects of the hydrant work properly.

D. Fire hydrants shall be American Darling FHA B-84-B, or equal.

2.05 WATER METER

A. Water meters through 2-inch diameter shall comply with AWWA C700 and NSF 61 standards. Water meters through 6-inch diameter shall comply with AWWA C715 and NSF 61 standards. The meter housing, bottom plates, and trim shall be bronze. The measuring chamber, disc, strainer, generator housing, register lid, and shroud shall be thermoplastic. The magnet shall be ceramic. The disc and magnet spindles shall be stainless steel. External bolts shall be non-corrosive metal.

B. Water meters shall be rated for continuous operation and have a maximum operating pressure of 150 psi. The measuring element shall be a positive displacement mutating disc. An oscillating piston-type meter is not acceptable. The sealed register shall consist of a straight reading, odometer-type totalizing display with a 10,000,000-gallon capacity (minimum) for meters smaller than the 1.5-inch unit and a 100,000,000-gallon capacity (minimum) for the 1.5-inch meter and larger, 360º test circle with center sweep hand, and flow finder to detect leaks. All meters shall have rigid, non-ferrous strainers that are easily removable and have an effective straining area of double that of the main-case inlet.

C. The meters shall have the following minimum characteristics:

Meter Size (inches)	Minimum Test Flow	Normal Test Flow Limits	Pressure Loss @AWWA Max. Cap.	Laying Length (inches)
5/8 x 3/4	1/4 gpm	1/2 – 20 gpm	5.0 psi	7-1/2
3/4 x 3/4	3/8 gpm	3/4 – 30 gpm	7.5 psi	7-1/2 (only)
1	3/4 gpm	1-1/4 – 50 gpm	7.0 psi	10-3/4
1-1/2	1-1/4 gpm	2-1/2 – 100 gpm	7.5 psi	12-5/8 or 13
2	1-1/2 gpm	2-1/2 – 160 gpm	9.0 psi	15-1/4 or 17
6	9 gpm	40 – 800 gpm	2.0 psi	18

D. Water meters up to 2 inches in diameter shall be Badger Recordall Model, Neptune, or approved equal. Water meters greater than 6" in diameter shall be Neptune Mach 10 Ultrasonic or approved equal. Headloss through the meter shall not exceed the published headloss through the named meters at any point on the headloss curve.

E. Water meters larger than 1 inch shall have flanges for inlet and outlet connections; other water meters shall have threaded male inlet and outlet. All meters shall be easily removed from the installed piping.

2.06 STRAINERS

A. Strainers shall be installed where indicated on the Drawings and as specified in this Section. Unless specified otherwise, strainers shall be Y-pattern units with flanged ends and cap, brass or cast-iron body, and stainless steel screens. Screens shall have 40-mesh perforations. Strainers shall be Neptune or approved equal. The blow off from each strainer shall be equipped with a shutoff valve. Blow-down shutoff valves 3/4-inch and smaller shall be provided with male threaded hose adapters. Strainers upstream from double mechanical pump seals shall have 80-mesh screens.

B. A strainer installed in piping immediately upstream from a solenoid valve in water service shall be a Y-pattern unit with brass or bronze body and monel or stainless steel screen. Strainers shall be Neptune or approved equal. The blow off from each strainer shall be equipped with a shutoff valve.

C. A strainer installed in piping immediately upstream from each 2-inch or smaller pressure-reducing valve shall be a Y-pattern unit with bronze, brass, or cast-iron body and monel or stainless steel screen. Strainers shall be Neptune or approved equal. Strainers installed in copper piping shall be of bronze or brass construction. The blow off from each strainer shall be equipped with a shutoff valve.

2.07 TOOLS

A. If required for normal operation and maintenance, special tools shall be supplied with the equipment. Two T-handle wrenches to operate standard 2-inch nuts on buried valves and buried valve actuators shall be provided as part of the work.

PART 3 EXECUTION

3.01 INSTALLATION

A. The Contractor shall install all piping appurtenances as shown on the Drawings.

B. All piping appurtenances shall be installed in the location shown, unless approved otherwise, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the Owner and the Engineer.

C. Install concrete inserts for hangers and supports as soon as forms are erected and before concrete is poured. Before setting these items, the Contractor shall check all plans and figures which have a direct bearing on their location and shall be responsible for the proper location of these piping appurtenances during the construction of the structures.

3.02 SHOP PAINTING

A. Exterior surfaces of ferrous valves and piping appurtenances shall be painted in accordance with Section 09900, Painting and Coating, unless noted or specified otherwise.

3.03 INSPECTION AND TESTING

A. Completed valves and piping appurtenances shall be subjected to hydrostatic pressure test as described in Section 15055, Piping Systems—General, and the detail pipe sections of these Specifications. All leaks in valves and piping appurtenances shall be repaired and lines retested as approved by the Engineer. Before testing, the valves and pipelines shall be supported and thrust restrained for forces in excess of the test pressure to prevent movement during tests.

END OF SECTION

SECTION 15141
DISINFECTION OF PIPING AND WATER STORAGE FACILITIES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section describes requirements for materials and procedures for disinfecting water mains by the continuous feed method and the slug method as well as for disinfecting water storage facilities. The Contractor shall disinfect piping in accordance with Rule 62-555.340, FAC, and AWWA C651 and disinfect water storage facilities in accordance with Rule 62-555.340, FAC, and AWWA C652, except as modified below.

B. Use potable water for chlorination.

C. Submit request for use of water from waterlines of the Owner at least 48 hours in advance.

D. If water for disinfection and/or flushing is supplied from a temporary connection to the existing distribution system, appropriate backflow prevention methods shall be used.

E. Proper disposal of the chlorinated disinfection water and the flushing water is the Contractor's responsibility. Disinfected water shall be neutralized in accordance with AWWA C651 and C652 before discharge.

F. Before permit review and coordination with the Owner and appropriate regulatory authorities (i.e., FDEP and Pasco County Health Department), the Contractor shall provide a schedule for the rate of flow and locations of discharges for the disinfection of piping and water storage facilities. The neutralized discharge water shall be disposed of by discharging to the nearest sanitary sewer (check with the Owner) to the local stormwater system through on-site swales or by other approved means. Discharge to the local stormwater system shall be routed to avoid swale overflow and/or erosion. The Contractor shall be responsible for any damage that occurs related to the discharging process. The Contractor shall repair or replace any damage caused by discharging to the Owner’s satisfaction at no additional expense to the Owner.

G. It is the responsibility of the Contractor to implement and enforce strict adherence to safety guidelines which are addressed in AWWA C651 and C652 as well as safety and handling instructions from the manufacturer. The Contractor shall

comply with all applicable national, state, and local safety regulations and requirements, including OSHA.

1.02 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Water Works Association (AWWA)

1. AWWA B300—Hypochlorites.
2. AWWA B301—Liquid Chlorine.
3. AWWA C651—Disinfecting Water Mains.
4. AWWA C652—Disinfection of Water – Storage Facilities.

B. Florida Administrative Code (FAC)

1. FAC 62-555.340—Disinfection and Bacteriological Evaluation of Public Water System Components.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.05 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 LIQUID CHLORINE

A. Liquid chlorine shall conform to AWWA B301 and shall be applied in strict accordance with AWWA C651 and AWWA C652.

2.02 CALCIUM HYPOCHLORITE (DRY)

A. Calcium hypochlorite shall conform to AWWA B300 and shall be applied in strict accordance with AWWA C651 and AWWA C652. Calcium hypochlorite intended for swimming pool chlorination shall not be used under any circumstances.

2.03 SODIUM HYPOCHLORITE (SOLUTION)

A. Sodium hypochlorite shall conform to AWWA B300 and shall be applied in strict accordance with AWWA C651 and AWWA C652.

2.04 CHLORINE RESIDUAL TEST KIT

A. For measuring chlorine concentration, the Contractor shall supply and use a medium-range, drop count, DPD drop dilution method kit in accordance with AWWA C651 and AWWA C652. Maintain kits in good working order available for immediate test of residuals at point of sampling.

PART 3 EXECUTION

3.01 GENERAL DISINFECTION PROCEDURE

A. Before disinfection, the Contractor shall inspect materials for quality. The Contractor shall use materials and equipment that are appropriate for the disinfection methods selected. The Contractor shall observe the precautionary guidelines given in AWWA C651 and C652.

B. During construction, the Contractor shall take preventative measures in accordance with AWWA C651 to protect materials from contamination.

C. Hydrostatic testing shall be successfully performed before disinfection.

D. Before disinfection, the Contractor shall clear water mains and water storage facilities of foreign debris:

1. Pipelines which are less than 24 inches in diameter shall be flushed, while pipelines which are greater than 24 inches in diameter may be cleared via broom-sweeping in accordance with AWWA C651 and as specified in Section 15144, Pressure Testing of Piping. Sweepings shall be removed from pipeline before the disinfection process begins.
2. Water storage facilities shall be cleared of all materials that are not part of the structural or operating facilities of the tank and shall be cleared of all

debris in accordance with AWWA C652. After the water storage facility has been cleaned, all screened openings shall be inspected for quality of materials and adequate condition to prevent the entry of insects, birds, and other possible contaminants into the tank. The Contractor shall properly disinfect any materials that enter the tank after cleaning in accordance with AWWA C652 before placement in the tank.

E. In accordance with AWWA C651 and C652 procedures, the Contractor shall disinfect all newly constructed materials and existing materials which may have been contaminated during construction. The Contractor shall provide adequate documentation that the required disinfection level (i.e., required chlorine residual and contact time) was successfully achieved.

F. In accordance with Rule 62-555.340, FAC, following disinfection the total chlorine residual in the water mains and water storage facilities shall be reduced to 4 mg/L. The chlorine residual may be reduced via flushing with potable water or by a neutralizing agent that conforms to AWWA C651 and C652.

G. After the total chlorine residual has been reduced to 4 mg/L, the Contractor shall conduct bacteriological testing for water mains and water storage facilities. Bacteriological sampling and testing shall be performed in accordance with Rule 62-555.340, FAC.

H. The Contractor shall dispose of residue from cleaning and other construction operations as well as water from dewatering operations in a manner satisfactory to FDEP and the Pasco County Health Department.

3.02 CONTINUOUS-FEED METHOD FOR PIPELINES

A. Continuous-feed disinfection shall be performed in accordance with AWWA C651. The Contractor shall introduce potable water into the pipeline at a constant measured rate. Feed the chlorine solution into the same water at a measured rate. Proportion the two rates so that the free chlorine concentration in the pipeline is maintained at a minimum concentration of 25 mg/L. Inject chlorine into the main at a point no greater than 3 feet downstream of the start of the new water main. Using the appropriate test kits specified by AWWA C651, the Contractor shall check the concentration at points downstream during the filling to ascertain that sufficient chlorine is being added. The water main shall be completely filled with chlorinated water. The chlorine contact time shall be at least 24 hours. The water shall be chlorinated so that after 24 hours the concentration of free chlorine residual in the water main shall be not less than 10 mg/L.

3.03 SLUG METHOD FOR PIPELINES

A. The Contractor shall perform slug method disinfection in accordance with AWWA C651. Introduce the water in the pipeline at a constant measured rate. At a point no greater than 3 feet downstream of the start of the new water main, feed the chlorine solution into the pipeline at a measured rate so that the free chlorine concentration created in the pipeline is 100 mg/L. Using the appropriate test kits specified by AWWA C651, the Contractor shall check the concentration at points downstream during the filling to ascertain that sufficient chlorine is being added. Feed the chlorine for a sufficient period to develop a solid column or "slug" of chlorinated water that will, as it passes through the line, expose all interior surfaces to a concentration of at least 100 mg/L for at least 3 hours.

3.04 DISINFECTION OF VALVES, BLIND FLANGES, AND APPURTENANCES

A. During the period that the chlorine solution is in the pipeline or as the slug comes into contact with hydrants and valves, open and close valves at least three times to obtain a chlorine residual at hydrants and other pipeline appurtenances. Swab exposed faces of valves and blind flanges before bolting flanges in place with a 1% sodium hypochlorite solution.

3.05 DISINFECTION OF CONNECTIONS TO EXISTING PIPELINES

A. The Contractor shall disinfect isolation valves, pipe, and appurtenances in accordance with AWWA C651, Section 4.7. Flush with potable water until discolored water, mud, and debris are eliminated. Swab interior of pipe and fittings with a 1% sodium hypochlorite solution. After disinfection, flush with potable water again until water is free of chlorine odor.

3.06 CONFIRMATION OF RESIDUAL

A. After the chlorine solution applied by the continuous feed method has been retained in the pipeline for 24 hours, the Contractor shall confirm that a free chlorine residual of 10 mg/L minimum exists along the pipeline by sampling at air valves and other points of access, such as tapping valves.

B. With the slug method, confirm by sampling as the slug passes each access point and as it leaves the pipeline that the free chlorine concentration in the slug is at least 50 mg/L. If the free chlorine residual is less than 50 mg/L, the flow shall be stopped and the slug residual concentration shall be increased to 100 mg/L before disinfection may resume.

3.07 PIPELINE FLUSHING

A. After confirming the free chlorine residual and sufficient contact time, the Contractor shall flush the excess chlorine solution from the pipeline until the free chlorine concentration in the water leaving the pipe is no higher than 4 mg/L.

3.08 BACTERIOLOGICAL SAMPLING AND TESTING

A. In accordance with Rule 62-555.340, FAC, the Contractor shall collect and deliver required samples to a certified laboratory and obtain a bacteriologic quality test to demonstrate the absence of coliform organisms in each separate section of the pipeline and in each structure after chlorination and refilling. Samples shall be delivered to a certified laboratory within 6 hours of sampling:

1. For water mains, collect at least one set of samples from every 1,200 feet of the new water main, plus one set from the end of the line and at least one set from each branch. At each connection to an existing pipeline, take two additional samples.
2. The Contractor shall take care in the sampling of water storage facilities to ensure that the water sampled is representative of the facility. To obtain a representative sample, the storage facility shall be sampled from a tap connected directly to the storage facility or at a sample tap located on the outlet piping.

B. The Contractor shall take chlorine residual samples at the time bacteriological samples are taken. If the chlorine residual is greater than 4 mg/L, the bacteriological test shall be considered invalid and the residual shall be reduced to 4 mg/L and the bacteriological testing shall be performed until the required criteria are satisfied.

C. In accordance with AWWA C652, the Contractor shall test the water in the storage facility to ensure that no offensive odor has been imparted from the disinfection process.

3.09 REPETITION OF PROCEDURE

A. If the initial chlorination fails to produce required residuals and bacteriologic tests, the Contractor shall repeat the chlorination and testing until satisfactory results are obtained.

B. If the water main is installed before satisfactory bacteriological results are achieved, a precautionary boil water notice must be issued if recommended by the water supplier or if recommended by the Florida Department of Health's

"Guidelines for the Issuance of Precautionary Boil Water Notices" in accordance with Rule 62-555.340, FAC.

3.10 TEST FACILITY REMOVAL

A. After satisfactory disinfection, the Contractor shall disinfect and replace air valves, restore the pipe coating, and complete the pipeline where temporary disinfection or test facilities were installed.

3.11 PIPING TO BE DISINFECTED

A. Disinfect all piping as indicated on the Piping Schedule on the Drawings.

3.12 DISINFECTION OF STRUCTURES (NOT USED)

END OF SECTION

SECTION 15144
PRESSURE TESTING OF PIPING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section specifies the hydrostatic, pneumatic, and leakage testing of pressure piping for pumping stations, wastewater treatment plants, water treatment plants, and other facilities; water distribution and transmission mains; and raw sewage force mains and lift stations.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Test bulkhead locations and design calculations, pipe attachment details, and methods to prevent excessive pipe wall stresses.

B. Six copies of the test records to the Engineer upon completion of the testing.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Water Works Association (AWWA)

1. AWWA C600—Installation of Ductile Iron Mains and Their Appurtenances.
2. AWWA C605—Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings.
3. AWWA C906—Polyethylene (PE) Pressure Pipe and Fittings, 4-Inch through 63-Inch (100 mm through 1,650 mm), for Waterworks.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 TEST PRESSURES

A. Test pressures for the various services and types of piping are shown in the Piping Schedule in the Drawings. At a minimum, the Contractor shall perform pressure and leakage test at 1.5 times the maximum system pressure or 100 psi, whichever is greater (based on the elevation or the lowest point of the section under test and corrected for gage location).

1.07 TESTING RECORDS

A. The Contractor shall provide records of each piping installation during the testing. These records shall include the following information:

1. Date and times of test.
2. Identification of process, pipeline, or pipeline section tested or retested.
3. Identification of pipeline material.
4. Identification of pipe specification.
5. Test fluid.
6. Test duration.

B. Test pressure at low point in process, pipeline, or pipeline section.

C. Remarks: Leaks identified (type and location), types of repairs, or corrections made.

D. Certification by the Contractor that the leakage rate measured conformed to the Specifications.

1.08 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 VENTS AND DRAINS FOR ABOVEGROUND PIPING

A. The Contractor shall install vents on the high points of aboveground piping, whether shown in the Drawings or not. Install drains on low points of aboveground piping, whether shown in the Drawings or not. Provide a valve at each vent or drain point. Valves shall be 3/4 inch for piping 3 inches and larger and 1/2 inch for piping smaller than 3 inches. Valves shall be ball or gate valves unless otherwise shown on the Drawings. Valves shall be rated for the pressure of the adjacent piping and shall be suitable for use with the adjacent pipe material.

2.02 MANUAL AIR-RELEASE VALVES FOR BURIED PIPING

A. The Contractor shall provide temporary manual air-release valves at test bulkheads for pipeline test. Construct the pipe outlet in the same manner as for a permanent air valve and, after use, seal with a blind flange, pipe cap, or plug and coat the same as the adjacent pipe.

2.03 TEST BULKHEADS

A. The Contractor shall design and fabricate test bulkheads in accordance with Section VIII of the ASME Boiler and Pressure Vessel Code. Materials shall comply with Part UCS of the code. Design pressure shall be at least 2.0 times the specified test pressure for the section of pipe containing the bulkhead. Limit stresses to 70% of yield strength of the bulkhead material at the bulkhead design pressure. Include air-release and water drainage connections.

2.04 TESTING FLUID

A. The Owner will provide a source of supply from the existing treated water distribution system for the Contractor’s use in filling the lines. An air-break shall be maintained at all times between the Owner’s distribution system and the Contractor’s equipment to prevent cross-connection. The line shall be slowly filled with water and the specified test pressure shall be maintained in the pipe for the entire test period by means of a pump furnished by the Contractor. Provide accurate means for measuring the quantity of water required to maintain this pressure. The amount of water required is a measure of the leakage.

B. Testing fluid shall be potable water unless a pneumatic test is indicated on the Piping Schedule.

C. For fuel oil piping, use potable water for hydrostatic testing and flushing.

D. For potable water pipelines, obtain and use only potable water for hydrostatic testing.

E. Submit request for use of water from waterlines of the Owner 48 hours in advance.

F. The Contractor shall provide back flow prevention control for temporary connections to existing water mains.

2.05 TESTING EQUIPMENT

A. The Contractor shall provide calibrated pressure gauges, pipes, bulkheads, pumps, compressors, chart recorder, and meters to perform the hydrostatic testing. The Contractor shall provide any necessary assistance required for testing.

PART 3 EXECUTION

3.01 TESTING PREPARATION

A. Pipes shall be in place, backfilled, and anchored before beginning pressure testing.

B. The Contractor shall conduct pressure tests on exposed and aboveground piping after the piping has been installed and attached to the pipe supports, hangers, anchors, expansion joints, valves, and meters.

C. For buried piping, the pipe may be partially backfilled and the joints left exposed for inspection during an initial leakage test. However, perform the final pressure test after completely backfilling and compacting the trench.

D. Provide any temporary piping needed to carry the test fluid to the piping that is to be tested. After the test has been completed and demonstrated to comply with the Specifications, disconnect and remove temporary piping. Do not remove exposed vent and drain valves at the high and low points in the tested piping; remove any temporary buried valves and cap the associated outlets. Plug taps or connections to the existing piping from which the test fluid was obtained.

E. Provide temporary drain lines needed to carry testing fluid away from the pipe being tested. Remove such temporary drain lines after completing the pressure testing.

F. Before starting the test, the Contractor shall notify the Engineer and the Owner's Representative.

3.02 CLEANING

A. Before conducting hydrostatic tests, the Contractor shall flush pipes with water to remove dirt and debris. For pneumatic tests, blow air through the pipes. Maintain a flushing velocity of at least 3 fps for water testing and at least 2,000 fpm for pneumatic testing. Flush pipes for the period given by the formula

$$T = \frac{2L}{3}$$

in which:

T = flushing time (seconds)
L = pipe length (feet).

B. For pipelines 24 inches or larger in diameter, acceptable alternatives to flushing are use of high-pressure water jet, sweeping, or scrubbing. Water, sediment, dirt, and foreign material accumulated during this cleaning operation shall be discharged, vacuumed, or otherwise removed from the pipe.

3.03 TESTING AND DISINFECTION SEQUENCE FOR POTABLE WATER PIPING

A. Perform required disinfection after hydrostatic testing, unless otherwise indicated.

B. Disinfection shall be performed as described in Section 15141, Disinfection of Piping and Water Storage Facilities.

3.04 LENGTH OF TEST SECTION FOR BURIED PIPING

A. The maximum length of test section for buried pipe of 12 inches or smaller in diameter is 3,500 feet; for buried pipe larger than 12 inches, 1 mile. Provide intermediate test bulkheads where the pipeline length exceeds these limits.

3.05 INITIAL PIPELINE FILLING FOR HYDROSTATIC TESTING

A. The maximum rate of filling shall not cause the water velocity in the pipeline to exceed 1 fps. Filling may be facilitated by removing automatic air valves and releasing air manually.

3.06 TESTING NEW PIPE WHICH CONNECTS TO EXISTING PIPE

A. Before testing new pipelines that are to be connected to existing pipelines, the Contractor shall isolate the new line from the existing line by test bulkheads,

spectacle flanges, or blind flanges. After the new line has been successfully tested, remove test bulkheads or flanges and connect to the existing piping.

3.07 HYDROSTATIC TESTING OF ABOVEGROUND OR EXPOSED PIPING

A. Open vents at high points of the piping system to purge air while the pipe is being filled with water. Venting during system filling may also be provided by temporarily loosening flanges.

B. Subject the piping system to the test pressure indicated on the Piping Schedule in the Drawings. Maintain the test pressure for a minimum of 2 hours. Examine joints, fittings, valves, and connections for leaks. The piping system shall show zero leakage or weeping. Correct leaks and retest until zero leakage is obtained.

3.08 HYDROSTATIC TESTING OF BURIED PIPING

A. Where any section of the piping contains concrete thrust blocks or encasement, the Contractor shall not make the pressure test until at least 10 days after the concrete has been placed. When testing mortar-lined or PVC piping, fill the pipe to be tested with water and allow it to soak for at least 24 hours to absorb water before conducting the pressure test.

B. Apply and maintain the test pressure by a positive displacement hydraulic force pump.

C. Maintain the test pressure for the 2 hours by restoring the pressure whenever it falls 5 psi.

D. After the test pressure is reached, use a meter to measure the additional water added to maintain the pressure. This amount of water is the loss due to leakage in the piping system. The allowable leakage volume is defined by the formulas:

PVC Pipe:

$$L = \frac{ND(P)^{1/2}}{C}$$

in which:

L = allowable leakage (gallons)
N = number of rubber-gasketed joints in the pipe tested
D = diameter of the pipe (inches)
P = specified test pressure (psig)
C = 7,400

Ductile Iron Pipe:

$$L = \frac{SD(P)^{1/2}}{C}$$

in which:

L = allowable leakage (gallons)
S = length of pipe tested (feet)
D = diameter of the pipe (inches)
P = specified test pressure (psig)
C = 133,200

HDPE Pipe: As specified in Section 15146, High-Density Polyethylene (HDPE) Pipe.

E. The leakage test shall be a separate test following the pressure test and shall not be less than 2 hours long. All leaks evident at the surface shall be repaired and leakage eliminated regardless of the total leakage as shown by test. Lines that fail to meet tests shall be repaired and retested as necessary until test requirements are complied with. Defective materials, pipes, valves, and accessories shall be removed and replaced.

F. The allowable leakage for buried piping having threaded, brazed, or welded (including solvent welded) joints shall be zero.

G. Submit plan for testing to the Engineer for review at least 10 days before starting the test.

H. Peening shall not be used to repair pinhole leaks in welded pipes. Any leakage in welded pipes shall be repaired by appropriate welding techniques.

I. Repair and retest any pipes showing leakage rates greater than that allowed in the criteria above.

3.09 HYDROSTATIC FLUSHING AND TESTING OF FUEL OIL PIPING

A. Flush pipes with water to remove dirt and debris. Remove loose foreign material such as scale, sand, weld spatter particles, and cutting chips from the inside of piping assemblies. Hammer on the outside of steel piping with a nonmarring hammer to aid in freeing weld spatter, scale, and dirt.

B. Perform hydrostatic pressure testing as described previously.

C. After successfully completing the pressure testing, blow out the piping with clean, dry air having a dewpoint of at least -40°F. Circulate the air through the piping system until the exiting air has the same dewpoint as the applied air.

3.10 PRESSURE TESTING OF DOUBLE-WALLED CONTAINMENT PIPING

A. Test the primary pipe as described for buried and above-ground or exposed piping.

B. Test the secondary containment piping by performing a pneumatic test as described above of the annular space between the primary and secondary pipes at a pressure of 5 psi.

3.11 REPETITION OF TEST

A. If the actual leakage exceeds the allowable leakage, locate and correct the faulty work and repeat the test. Restore the work and all damage resulting from the leak and its repair. Eliminate visible leakage.

3.12 BULKHEAD AND TEST FACILITY REMOVAL

A. After a satisfactory test, the Contractor shall remove the testing fluid, remove test bulkheads and other test facilities, and restore the pipe coatings/linings.

END OF SECTION

SECTION 15146
HIGH-DENSITY POLYETHYLENE (HDPE) PIPE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Description: The Contractor shall provide all materials and incidentals, including piping, molded and ductile iron fittings, flanged adapters, flanged joints, mechanical joint adapters, hardware, and appurtenances for the HDPE piping systems shown on the Drawings and the Drawing Process Flow Identification.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance, and Section 15055, Piping Systems—General.

A. In general, shop drawings and related manufacturer's product certification shall be made in accordance with the General and Special Conditions of the Contract for approval before the manufacturer constructs or fabricates the material. The following items, which require shop drawings, are brought to the Contractor's attention. The list may not include all items for which shop drawing submittals are required to meet the requirements of the project.

1. Detail drawings of all classes of pipe, joints, and fittings.
2. Detail Drawings of all joints, including manufacturer's certified factory and/or laboratory test reports to confirm thrust-restraint capacities and restraining mechanism application.
3. Existing piping connection details.
4. Adapters for connection to mechanical joint valves and ductile iron pipe fittings.

B. Certification and test reports for the materials, manufacturing, and testing of the types of pipe supplied shall be furnished by the HDPE pipe manufacturer for the manufacturer's own products in accordance with the latest standards of the industry as described in this Section.

C. Provide a statement in writing from the HDPE pipe manufacturer that the manufacturer is listed with the Plastic Pipe Institute as a qualified extruder for the polyethylene resin to be used in the manufacture of the pipe for this project.

D. All persons making heat fusion joints shall receive training in the manufacturer's recommended procedures. The Contractor shall maintain records of trained

personnel and certify that training was received not more than 12 months before construction began. Additionally, the Contractor shall have worked on one or more projects involving combined installation of at least 10,000 feet of HDPE butt-fusion-welded pipe and shall provide the Engineer with a written list of HDPE pipeline installation experience, including project location, date, Owner, and personnel assigned and installing on this project.

E. The pipe manufacturer shall certify in writing that the Contractor is qualified to join, lay, and pull the pipe or representative of the pipe manufacturer shall be onsite to oversee all pipe joining. All costs for the manufacturer's representative shall be paid for by the Contractor.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM) Standards

1. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.
2. ASTM D3261—Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
3. ASTM D3350—Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
4. ASTM D4976—Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.
5. ASTM F714—Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter.

B. American Water Works Association (AWWA)

1. AWWA C151/A21.51—Ductile Iron Pipe, Centrifugally Cast, for Water.
2. AWWA C901—Polyethylene (PE) Pressure Pipe and Tubing, 1/2-inch (13 mm) through 3-Inch (76 mm), for Water Service.
3. AWWA C906—Polyethylene (PE) Pressure Pipe and Fittings, 4-Inch through 63-Inch (100 mm through 1,650 mm), for Waterworks.

C. International Organization for Standardization (ISO)

1. ISO 9001—Quality Management Systems – Requirements.

1.04 QUALITY ASSURANCE

A. The pipe and fitting manufacturer(s) shall have an established quality-control program responsible for inspecting incoming and outgoing materials. Incoming polyethylene materials shall be inspected for density, melt flow rated, and contamination. The cell classification properties of the material shall be certified by the supplier and verified by the manufacturer's quality control.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, and Section 15055, Piping Systems—General, for storing and protecting the items specified in this Section.

1.07 TESTING REQUIREMENTS

A. See Section 15144, Pressure Testing of Piping.

1.08 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 PIPE AND FITTINGS

A. General

1. All HDPE shall be DriscoPlex PE4710 (PE3408) HDPE; or approved equal.
2. All HDPE pipe 4 inches in diameter or greater shall have a Ductile Iron Pipe outside diameter, and HDPE pipe 3 inches in diameter and smaller shall be IPS unless otherwise specified or shown in the Drawings.
3. All HDPE piping system components shall be the products of one manufacturer.
4. Pipe and fittings shall be manufactured by an ISO 9001-certified manufacturer.

B. HDPE Pipe

1. HDPE pipe 4 inches in diameter and larger shall conform to material standard ASTM D3350 345434 E cell classification rated as PE4710 (PE3408) by the Plastics Pipe Institute. Minimum pressure rating shall be in accordance with Piping Schedule Drawing or as specified in this Section. Minimum pressure rating for HDPE pipe used at directional drilling crossings shall be 160 psi SDR 11 (Standard Dimension Ratio).
2. The polyethylene compound shall be suitably protected against degradation by ultraviolet light.
3. The maximum allowable hoop stress shall be 800 psi at 73.4ºF.
4. The pipe manufacturer shall be listed with the Plastic Pipe Institute as meeting the requirements of the resin manufacturer to manufacture pipe from the resin used.

C. Fittings

1. The pipe manufacturer shall mold or fabricate the polyethylene fittings. Butt fusion outlets shall be made to the same outside diameter, wall thickness, and tolerances as the mating pipe. All fittings and custom fabrications shall be fully rated for the same internal pressure as the mating pipe.

    a. Molded Fittings: Molded fittings shall be manufactured in accordance with ASTM D3261 and shall be so marked. Each production lot of molded fittings shall be subjected to the test required under ASTM D3261. The manufacturer shall submit samples from each molded fitting production lot to x-ray inspection for voids and shall certify that voids were not found.

        (1) Polyethylene Flange Adapters: Flange adapter shall be made with sufficient throughbore length to be clamped in a butt fusion joining machine without the use of a subend holder. The sealing surface of the flange adapter shall be machined with a series of small v-shaped grooves to restrain the gasket against blow-out. Flange adaptors shall be fitted with ductile-iron backup rings pressure rated equal to or greater than the mating pipe. The Contractor shall provide flat ring-type Viton gaskets with gasket thickness and hardness as recommended by the pipe manufacturer for use with HDPE flanged joints. Provide carbon steel hardware (bolts, nuts, washers, etc.) conforming to ASTM A307, Grade B for use with the flange adapters assemblies in accordance with the pipe manufacturer’s

recommendations. Gaskets shall be made from material suitable for exposure to the liquid within the pipe.

b. Fabricated Fittings: Fabricated fittings shall be made by heat fusion joining specially machined shapes cut from pipe, polyethylene sheet stock, or molded fittings. Fabricated fittings shall be rated for internal pressure service equivalent to the full-service pressure rating of the mating pipe. Pressure de-rated fittings are not acceptable. Directional fittings 16 inches IPS and larger, such as elbows, tees, crosses, etc., shall have a plain end inlet for butt fusion and flanged directional outlets.

2. D.I./HDPE Mechanical Joint Adaptors.

a. The manufacturer of the HDPE pipe shall supply all D.I./HDPE mechanical joint adaptors and accessories required to connect plain-end HDPE piping to mechanical joint fittings, valves, and appurtenances.

b. The D.I./HDPE mechanical joint adaptor shall consist of:

(1) A molded or fabricated HDPE mechanical joint transition fitting.
(2) A Buna-N gasket for a D.I. mechanical joint.
(3) A ductile iron mechanical joint backup drive ring.
(4) Cor-Ten mechanical joint tee bolts.
(5) A stainless-steel sleeve stiffener molded or fabricated within the MJ end of the HDPE mechanical joint adaptor fitting.

c. The D.I./HDPE mechanical joint adaptor shall be connected to the HDPE pipe by a heat-fused joint on one end and connected to a ductile iron pipe valve, fitting, or appurtenance with the internally stiffened mechanical joint end.

d. The tee bolts and backup drive ring shall act as a joint restraint for connections to mechanical joints.

e. The HDPE mechanical joint adaptor fitting shall be molded or fabricated by the manufacturer of the HDPE pipe. All molded fittings shall be fully pressure rated to match the SDR pipe pressure rating. Fabricated fittings shall be rated for internal pressure service equivalent to the full pressure rating of the mated IPS pipe.

f. If rework compounds are required, only those generated in the manufacturer's own plant from resin compounds of the same class and type from the same raw material supplier shall be used.

g. Solvent epoxy cementing and mechanical joining with bolt on wrap-around clamps shall not be used.

3. Ductile-iron fittings connected to SDR 11 HDPE pipe (4 inches and larger) shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.

D. HDPE Pipe Jointing Method

1. HDPE pipe shall be jointed by butt fusion in accordance with the pipe manufacturer's directions and only for pipe within one SDR ratio of each other.
2. For SDR ratios that are two or more apart (i.e., SDR 21 to an SDR 11), the joint shall be made using a restrained joints. Same-diameter pipe may be joined by using HDPE flange adapters and backup rings bolted to each other.
3. All HDPE pipe joined by butt fusion shall be made from the same class and type of raw material made by the same raw material supplier.
4. *Butt fusion* means the butt joining of the pipe by heat fusion aligned faces of the pipe ends (butts) in a suitable apparatus and joining under controlled pressure and alignment.
5. The external bead resulting from the butt-fusion process shall be visible and examined for complete butt-fusion 360^{o} around the pipe exterior.
6. Short spools of pipe between valves and fittings shall be ductile iron pipe, with all joints restrained for sizes 4 inches and larger. For 2-inch, the spool shall be Schedule 40 Type 304 stainless steel piping or Schedule 80 PVC piping with IP threads stainless steel or PVC fittings and all joints restrained.
7. Where approved by the Engineer, the HDPE pipe and fittings may be fused with Electrofusion Couplings, as manufactured by Central Plastics Company, or approved equal. Technical information must be provided to demonstrate that the fused coupling will not compromise the structural integrity of the HDPE pipe.

2.02 LOCATOR WIRE

A. All HDPE piping shall be installed with two insulated 12-gauge minimum AWG solid strand copper wires for location purposes as specified in Section 15055, Piping Systems—General.

PART 3 EXECUTION

3.01 GENERAL

A. All polyethylene pipe shall be cut, fabricated, joined, and installed in strict conformance with the pipe manufacturer's recommendations. Joining, laying, and pulling of polyethylene pipe shall be accomplished by personnel experienced in working with HDPE pipe.

3.02 LAYING PIPE

A. Joints

1. All HDPE to HDPE pipe joints shall be joined by heat fusion that produces homogeneous, sealed, leak-tight joints.
2. Restrained mechanical joint adaptors shall be provided at tie-ins with valves, ductile iron fittings, and other pipe materials.

B. Butt Fusion Testing

1. The Contractor shall test the first fusion of each day.
2. In testing, the fusion shall be allowed to cool completely and then fusion test straps shall be cut out. The test shall be a minimum of 12 inches or 30 times the wall thickness in length with the fusion in the center and a minimum of 1 inch or 1.5 times the wall thickness in width. Bend the test strap until the ends of the strap touch. The Contractor shall not begin until a fusion test has passed the bent strap test.

C. Pipe Deflection

1. When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane or where long radius curves are permitted, the amount of deflection shall not exceed 75% of that recommended by the manufacturer.

D. Pipe Cutting

1. Cutting HDPE butt fusion connections to HDPE pipe, valves, fittings, or closure pieces shall be done in a neat, workman-like manner without damaging the pipe. Ends shall be cut square and perpendicular to the pipe axis.

3.03 PERFORATED HDPE PIPING INSTALLATION (NOT USED)

3.04 FLUSHING AND CLEANING

A. Flushing and Cleaning shall be as specified in Section 15144, Pressure Testing of Piping.

3.05 TESTING AND LEAKAGE

A. Hydrostatic Tests—General

1. All testing shall comply with Section 15144, Pressure Testing of Piping, except as specified in this Section.

2. All field tests shall be made in the presence of the Owner or Engineer. Except as otherwise directed, all pipelines shall be tested. All piping to operate under liquid pressure shall be tested in sections of approved length, typically from valve to valve and in no case longer than 5,000 feet.

3. Hydrostatic testing shall consist of a combined pressure test and leakage test. The field test pressure shall be as indicated on the Drawing Piping Schedule, measured at the lowest point of the section being tested. The pressure shall be applied by a pump connected to the pipe in a manner satisfactory to the Engineer. The pump, pipe connection, and all necessary apparatus shall be furnished by the Contractor and shall be subject to the satisfaction of the Engineer.

4. The maximum duration for any test, including initial pressurization, initial expansion, and time at test pressure, must not exceed 8 hours. If the test is not completed due to leakage, equipment failure, etc., depressurize the test section and allow it to "relax" for at least 8 hours before bringing the test section up to test pressure again.

5. Monitored Make-Up Water Test: The test procedure consists of initial expansion and test phases.

   a. During the initial expansion phase, the test section is filled with water. Once the line is filled, make-up water is added at hourly intervals as required to maintain the test pressure for 3 hours.
   b. At the end of the initial expansion period, the addition of make-up water will cease. During the test phase, the pipe will not have any water added to it for the following 2 hours. The 2 hours will be the actual leakage test. At the end of the 2-hour period, measured make-up water will be added to the pipe to return it to the original test pressure.

c. If the amount of make-up water added is greater than calculated using the numbers listed below, the section being tested will be considered to have a leak. The leak shall be found and fixed at the Contractor's expense and that section of the line retested before continuing with subsequent leakage tests. Testing and repairs shall be repeated at the Contractor's expense until the amount of make-up water is less than the amount calculated using the numbers listed below.

ALLOWABLE FOR EXPANSION UNDER TEST PRESSURE*
POLYETHYLENE PIPE

Nominal Pipe Size (in.)	Allowances for Expansion (US Gal/100 Feet of Pipe)		
	1-Hour Test	2-Hour Test	3-Hour Test
6	0.30	0.60	0.90
12	1.1	2.3	3.4

These allowances only apply to the test phase and not to the initial expansion phase.

END OF SECTION

SECTION 15155
DUCTILE IRON PIPE AND FITTINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall provide all materials and incidentals, including piping, fittings, flanged joints, mechanical joints, retainer glands, polyethylene bagging for buried ductile iron piping, fittings, valves, and appurtenances for the ductile iron piping systems required for the work shown on the Drawings in the Piping Schedule.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. All ductile iron pipe and fittings to be installed under this Contract shall be inspected and tested at the foundry where the material for this project is manufactured. The Contractor shall submit sworn certificates of such tests and their results.

B. Shop Drawings, including layout drawings, shall be submitted as specified in Section 15055, Piping Systems—General.

C. The Contractor shall submit the pipe manufacturer's certification of compliance with the applicable Sections of the Specifications.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM A193/A193M—Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.

2. ASTM A194/A194M—Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure and High Temperature Service, or Both.
3. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.
4. ASTM A536—Standard Specification for Ductile Iron Castings.
5. ASTM A563—Standard Specification for Carbon and Alloy Steel Nuts.
6. ASTM B117—Standard Practice for Operating Salt Spray (Fog) Apparatus.
7. ASTM C150/C150M—Standard Specification for Portland Cement.
8. ASTM C283—Standard Test Methods for Resistance of Porcelain Enameled Utensils to Boiling Acid.
9. ASTM D714—Standard Test Method for Evaluating Degree of Blistering of Paints.
10. ASTM D792—Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
11. ASTM D1238—Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer.
12. ASTM E96—Standard Test Methods for Water Vapor Transmission of Materials.
13. ASTM G95—Standard Test Method for Cathodic Disbondment Test of Pipeline Coatings (Attached Cell Method).

B. American Society of Mechanical Engineers (ASME)

1. ASME B1.1—Unified Inch Screw Threads (UN and UNR Thread Form).
2. ASME B16.1—Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250.

C. American Water Works Association (AWWA)

1. AWWA C104/A21.4—Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
2. AWWA C110/A21.10—Ductile-Iron and Gray-Iron Fittings.
3. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
4. AWWA C115/A21.15—Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
5. AWWA C150/A21.50—Thickness Design of Ductile-Iron Pipe.
6. AWWA C151/A21.51—Ductile-Iron Pipe, Centrifugally Cast.
7. AWWA C153/A21.53—Ductile-Iron Compact Fittings.
8. AWWA C207—Steel Pipe Flanges for Waterworks Service Sizes, 4-Inch through 144-Inch (100 mm through 3,600 mm).

9. AWWA C600—Installation of Ductile-Iron Mains and their Appurtenances.
10. AWWA C651—Disinfecting Water Mains.

D. International Organization for Standardization (ISO)

1. ISO 9001—Quality Management Systems – Requirements.

E. NSF International (NSF)

1. NSF 61—Drinking Water System Components – Health Effects.

1.04 QUALITY ASSURANCE

A. Source Quality Control:

1. The ductile iron pipe manufacturer shall submit certification that the pipe and fitting products meet all tests required by AWWA C151/A21.51.
2. All materials shall be new and have a manufacturer's certificate verifying compliance to all tests and inspections as required in this Section. The weight, class, and casting period shall be shown on each piece of pipe. The manufacturer's "mark," the year produced, and the word "Ductile" or the letters "DI" shall be cast or stamped on all pipe.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 TESTING REQUIREMENTS

A. See Section 15144, Pressure Testing of Piping, for testing requirements.

1.08 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 GENERAL

A. All ductile iron piping shall be designed and manufactured in accordance with AWWA C150/A21.50 and AWWA C151/A21.51 for the following minimum operating conditions:

1. The minimum internal design pressure shall be 150 psi with a 100-psi surge allowance, with a safety factor of 2, for a total internal design pressure of 500 psi.

2. The external loads design criteria shall be for the minimum cover indicated on the Drawings at 120 lb per cubic feet soil weight and live load based on one AASHTO H-20 truck load. The thickness design of ductile iron pipe shall be in accordance with AWWA C150/A21.50.

3. The horizontal deflection of cement-mortar-lined ductile iron pipe resulting from external load conditions shall not exceed 3% of the pipe diameter based on the trench design shown on the Drawings.

4. Pressure Class: All ductile iron piping shall meet the following minimum working pressure classes:

   a. 4 inches through 12 inches: 350 psi.
   b. Pipe greater than 12 inches: 250 psi.

2.02 JOINTS

A. Ductile iron fittings shall be furnished with mechanical joints and flanged joint ends as shown on the Drawings and specified in this Section:

1. Mechanical Joints: All buried ductile iron fittings shall be furnished with mechanical joint ends unless noted otherwise. Mechanical joints shall conform to AWWA C111/A21.11. Glands shall be constructed of ductile iron.
2. Flanged Joints: Pipe for threaded flange fabrication shall be Special Thickness Class 53 in accordance with AWWA C110/A21.10, AWWA C111/A21.11, and AWWA C115/A21.15. Bolt circle and bolt holes shall match those of ASME B16.1 Class 125 flanges. The flanges shall be rated for a maximum working pressure of 250 psi. Threaded flanges shall be individually fitted and machine tightened on the pipe ends. Flange facing shall be smooth or with shallow serrations in accordance with AWWA C115/A21.15.

2.03 FITTINGS

A. General: Ductile iron pipe fittings shall be the compact type meeting the requirements of AWWA C110/A21.10 and AWWA C153/A21.53 where applicable. Ductile iron fittings shall be cement lined and seal coated or epoxy lined. Lining of fitting shall conform to lining specified for piping and service as specified on the Drawing, Flow Stream Identification. Fittings shall be manufactured in accordance with AWWA C110/A21.10. Where taps are shown on fittings, tapping bosses shall be provided. At a minimum, fittings shall have the same pressure rating as the connecting pipe.

1. Flanged Joint: AWWA C110/21.10 and ASME B16.1, faced and drilled 125-pound ANSI standard.

2. Mechanical Joint: AWWA C110/A21.10.

   a. Provide mechanical joint fittings for all buried fittings as shown in the Drawings, unless noted otherwise.
   b. Provide specified gaskets.

2.04 LINING AND COATING

A. The Contractor shall provide lined ductile iron piping and fittings in accordance with the Drawing, Flow Stream Identification. The Contractor shall perform all field measurements confirming the accuracy of the piping sizes and lengths shown on the Drawings. The Contractor shall notify the Engineer immediately before deviating from or altering the lining of ductile iron piping shown on the approved layout schedule.

B. Ceramic Epoxy Lined Pipe and Fittings: The Contractor shall notify the Engineer immediately before cutting epoxy-lined ductile iron pipe in the field. The Contractor shall repair the cut end in accordance with the pipe manufacturer's written procedures.

1. General: The lining shall be an amine-cured novalac epoxy containing at least 20% by volume of ceramic quartz pigment. The lining material shall be Protecto 401 Ceramic Epoxy as manufactured by Induron Protective Coatings, Inc. The lining shall be applied by a competent pipe lining specialty firm with a successful history of applying linings to the interior of ductile iron pipe and fittings.

2. Lining Materials: Lining material shall meet the following requirements and properties:

a. A permeability rating of 0.00 when tested according to Method A of ASTM E96, Procedure A with a test duration of 30 days.
b. The following test shall be run on coupons from lined ductile pipe:

Test Parameter	ASTM Test Method	Typical Value
Salt Spray	B117	0.0 undercutting after 2 years
Cathodic disbondment 1.5 volts @ 77° F	G95	No more than 0.5 mm undercutting after 30 days
Immersion	D714	No effect after 2 years for 20% sulfuric acid, 140°F 25% sodium hydroxide, 160°F distilled water
Immersion	D714	0.0 undercutting after 2 years for 120°F tap water

3. Application: The lining applicator shall apply lining according to the requirements of the Protecto 401 Specification and application methods and procedures.

C. Cement-Lined Ductile Iron Pipe and Fittings: Interior surfaces of all cement-lined ductile iron pipe, fittings, and specials shall be cleaned and lined in the shop with a standard thickness cement-mortar lining applied in conformity with AWWA C104/A21.4, Portland cement mortar. Every precaution shall be taken to prevent damage to the lining. If lining is damaged or found faulty at delivery site, the Contractor shall repair or replace damaged or unsatisfactory portions with lining conforming to these Specifications at no additional cost to the Owner. Pipe linings for potable water lines shall be NSF 61 approved.

1. All ductile iron pipe and fittings cement-mortar linings shall be surface sealed with an asphaltic seal coating, 1 mil, in accordance with AWWA C104/A21.4.

2.05 MANUFACTURERS

A. Acceptable ductile iron pipe manufacturers include US Pipe, American Ductile Pipe, Griffin Pipe, or approved equal.

2.06 BOLTS

A. General: The Contractor shall provide carbon steel, ASTM A307, Grade A hex head bolts and ASTM A563, Grade A hex head nuts. Threads shall be as specified in ASME B1.1 coarse thread series, Class 2A external and Class 2B internal.

Nuts, bolts, and gaskets for flanged fittings and blind flanges shall be designed to withstand the design and test pressure ratings for the pipe.

2.07 GASKETS

A. Gaskets for mechanical joints shall be compatible with potable water or sewage pipe service. See Section 15055, Piping System—General, for gasket requirements.

B. Gaskets for flanged joints shall be 1/8-inch-thick, cloth-inserted rubber conforming to applicable parts of ASME B16.21 and AWWA C207. Gasket material shall be free from corrosive alkali or acid ingredients and suitable for use in sewage and reclaimed water lines. Gaskets shall be full-face type for 125-pound flanges.

2.08 RETAINER GLANDS

A. Retainer glands shall be provided for all buried ductile-iron mechanical joints, fitting, and ductile-iron pipe connections to buried valves. Retainer glands shall be designed for joint retaining through the use of a follower gland and set screw-anchoring devices that impart multiple wedging action against the pipe. The mechanical joint-restraint device shall be UL listed and shall have a working pressure of at least 250 psi with a minimum safety factor of 2.

1. Gland: Manufactured of ductile iron conforming to ASTM A536. Gland dimensions shall match AWWA C111/A21.11 and AWWA C153/A21.53.

2. Restraining Devices: Manufactured of ductile iron heat treated to a minimum hardness of 370 BHN. Restraining devices shall incorporate a set screw/twist-off nut bolt to ensure the proper actuating of the restraining device. The twist-off nut shall be designed to come off at the torque limit desired to anchor the restraining device in place on the pipe.

3. Joint Deflection: Retainer gland joint deflection shall be limited to manufacturer's recommended maximum deflection angle. Joint deflection shall be applied before the set screws are torqued.

4. Acceptable Manufacturers:

    a. EBAA Iron, Inc. – Megalug 1100 Series.
    b. Or approved equal.

2.09 EXTERNAL PIPE RESTRAINTS

A. Ductile iron pipe push-on (bell and spigot) joint restraint shall be provided by a restraining harness consisting of a restraint ring, connecting tie-rods, and split-ring assembly installed at all push-on joints. The restraint ring shall consist of wedging components made from 60-42-12 ductile iron conforming to ASTM A536 and wedges heat treated to minimum 370 BHN. Torque limiting twist-off nuts shall be provided on each wedge to ensure proper applied installation torque. The split ring shall be made from 60-42-12 ductile iron conforming to ASTM A536. The connecting rods shall be made of steel conforming to AWWA C111/ A12.11. Sizes 4- to 16-inch-diameter restraining harnesses shall have 350-psi maximum working pressure rating and 18- to 36-inch-diameter restraining harnesses shall have 250-psi maximum working pressure rating. All harnesses shall be designed with a 2-to-1 safety factor applied to the maximum working pressure rating.

B. Acceptable Manufacturers

1. EBAA Iron, Inc. – Series 1700.
2. Or approved equal.

2.10 INTERNAL PIPE RESTRAINT

A. Acceptable Manufacturers

1. American Ductile Iron Pipe:

a. Fast Grip ® Gasket.
b. Flex Ring ® Joint.

2. US Pipe:

a. Field Lok ® Gasket.
b. TR Flex Restrained Joint Pipe and Fittings.

3. Or Engineer-approved equal.

2.11 POLYETHYLENE BAGGING

A. Polyethylene bagging for buried ductile iron pipe, fittings, and valves shall be 8 mils thickness minimum polyethylene, manufactured in accordance with ASTM D1238, Type I, Class C, Grade E1.

2.12 COLOR CODING OR MARKING

A. All potable water main pipe, including fittings, shall be color coded or marked using blue as a predominant color to differentiate drinking water from reclaimed or other water. Underground plastic pipe shall be solid-wall blue pipe, shall have a co-extruded blue external skin, or shall be white or black pipe with blue stripes incorporated into or applied to the pipe wall; and underground metal or concrete pipe shall have blue stripes applied to the pipe wall. Pipe striped during manufacturing of the pipe shall have continuous stripes that run parallel to the axis of the pipe, that are located at no greater than 90° intervals around the pipe, and that will remain intact during and after installation of the pipe. If tape or paint is used to stripe pipe during installation of the pipe, the tape or paint shall be applied in a continuous line that runs parallel to the axis of the pipe and that is located along the top of the pipe; for pipes with an internal diameter of 24 inches or greater, tape or paint shall be applied in continuous lines along each side of the pipe as well as along the top of the pipe. Marking tape shall be 3 inches wide with adhesive backing. Paint stripe shall be 3 inches wide. Aboveground pipe at drinking water treatment plants shall be color coded and labeled in accordance with subsection 62-555-320(10), FAC, and all other aboveground pipe shall be painted blue or shall be color coded or marked like underground pipe.

B. All reclaimed water valves and outlets shall be appropriately tagged or labeled bearing the words in English and Spanish. All piping, pipelines, valves, and outlets shall be color coded or otherwise marked to differentiate reclaimed water from domestic or other water. Underground ductile iron pipe shall be color coded or marked using purple as a predominant color. If tape is used to mark the pipe, the tape shall be permanently affixed to the top and each side of the pipe (three locations parallel to the axis of the pipe). For pipes less than 24 inches in diameter, a single tape may be used along the top of the pipe. Visible, aboveground portions of the reclaimed water distribution system shall be clearly color coded or marked.

PART 3 EXECUTION

3.01 HANDLING PIPE AND FITTINGS

A. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe, fitting, lining, and coating. Pipe and fittings shall not be dropped. All pipe and fittings shall be examined before installation, and no piece that the Engineer finds defective shall be installed. The Contractor shall repair any damage to the pipe and fittings coating and/or lining as directed by the Engineer. If the Engineer determines that the coating and/or lining cannot be repaired, the Contractor shall replace the damaged pipe and fittings at no additional compensation.

B. All pipe and fittings shall be subjected to a careful inspection immediately before installation.

C. If any defective pipe is discovered after it has been installed, the Contractor shall remove and replace it with a pipe in satisfactory condition at no additional expense to the Owner.

D. Ceramic epoxy and glass-lined pipe and fittings shall be handled only from the outside of the pipe and fittings. No forks, chains, straps, hooks, etc. shall be placed inside the pipe and fittings for lifting, positioning, or laying.

3.02 PIPE INSTALLATION

A. The Contractor shall provide and use proper implements, tools, and facilities for the safe and convenient performance of the work. All pipe, fittings, valves, and appurtenances shall be lowered carefully into the trench and at above-grade locations to prevent damage to the pipe, protective coating, lining, and polyethylene bagging. Under no circumstances shall pipeline materials be dropped off or dumped. A trench shall be dewatered before the pipe is installed.

B. The Contractor shall carefully examine all pipe fittings, valves, and other appurtenances for damage and other defects immediately before installation and before bagging buried ductile-iron pipe. The Contractor shall mark and hold defective materials for inspection by the Engineer, who may prescribe corrective repairs or reject the materials.

C. The Contractor shall remove all lumps, blisters, and excess coating from the socket and plain ends of push-on joint pipe for buried service. The outside of the plain end and the inside of the bell shall be wiped clean and dry and be free from dirt, sand, grit, or any foreign material before the pipe is laid in trench.

D. The Contractor shall prevent foreign material from entering the pipe while the pipe is being placed in the trench. During installation, no debris, tools, clothing, or other materials shall be placed in the pipe.

E. As each length of buried pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.

F. When pipe is not being laid, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer. When practical, the plug shall remain in place until the trench is pumped completely dry. Care shall be taken to prevent pipe flotation should the trench fill with water.

G. Trench width at the top of pipe, bedding conditions, and backfill placement and compaction shall be such that design loadings on the pipe will not be exceeded.

H. Joint Assembly: Pipe joints shall be assembled in accordance with the manufacturer's instructions and the requirements of AWWA C600.

1. Flanged Joint: Before connecting flanged pipe the Contractor shall thoroughly clean all faces of the flanges of all oil, grease, and foreign material. The rubber gaskets shall be checked for proper fit and thoroughly cleaned. Care shall be taken to ensure proper sealing of the flange gasket. Bolts shall be tightened so that the pressure on the gasket is uniform. Torque-limiting wrenches shall be used to ensure uniform bearing insofar as possible. If joints leak when the hydrostatic test is applied, the gaskets shall be removed and reset and bolts retightened.
2. Push-On, Restrained Joint, or Mechanical Joint: The Contractor shall joint piping in accordance with the manufacturer's recommendations. Provide all special tools and devices, such as special jacks, chokers, and similar items required for proper installation. Lubricant for the pipe gaskets shall be furnished by the pipe manufacturer, and no substitutes will be permitted under any circumstance.

I. Pipe Deflection: When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane or where long radius curves are permitted, the amount of deflection shall not exceed that shown in AWWA C600 and that recommended by the retainer gland manufacturer for mechanical joint pipe and fittings.

J. Pipe Cutting: For inserting valves, fittings, or closure pieces pipe shall be cut in a neat, workmanlike manner without damaging the pipe or lining. Ductile cast iron may be cut using an abrasive pipe saw, rotary wheel cutter, guillotine pipe saw, milling wheel saw, or oxyacetylene torch. Cut ends and rough edges shall be ground smooth, and for push-on joint connections the cut end shall be beveled.

3.03 ABOVE-GROUND PIPE INSTALLATION

A. The Contractor shall install pipe in horizontal or vertical planes, parallel or perpendicular to building surfaces unless otherwise shown. Support pipe and fittings to prevent strain on joints, valves, and equipment. Install flanged joints so that contact faces bear uniformly on the gasket. Tighten bolts in accordance with the pipe manufacturer's recommendations.

3.04 SURFACE PREPARATION AND PAINTING

A. All exposed pipe and fittings shall be painted as specified in Section 09900, Painting and Coating.

B. All buried steel bolts, nuts, washers, rods, harnesses, clamps, sleeves, and appurtenances shall be painted with System No. 21 as specified in Section 09900, Painting and Coating.

3.05 INSPECTION, TESTING, AND DISINFECTION

A. See Section 15055, Piping Systems—General; Section 15141, Disinfection of Piping and Water Storage Facilities; and Section 15144, Pressure Testing of Piping.

END OF SECTION

SECTION 15291
POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND FITTINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to furnish, install, and complete the AWWA C900 DR 18 PVC pipe and ductile iron fittings specified.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. All PVC pipe and fittings to be installed under this Contract shall be inspected and tested at the location where the material for this project is manufactured. The Contract shall submit certificates of such tests and their results.

B. The Contractor shall submit the pipe manufacturer's certification of compliance with the applicable sections of the Specifications.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society of Testing Materials (ASTM)

1. ASTM A242/A242M—Standard Specification for High-Strength Low-Alloy Structural Steel.
2. ASTM A536—Standard Specification for Ductile Iron Castings.
3. ASTM D2241—Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
4. ASTM F477—Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

B. American Water Works Association (AWWA)

1. AWWA C900—Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4-Inch to 12-Inch (100 mm to 300 mm), for Water Transmission and Distribution.
2. AWWA C905—Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14-Inch through 48-Inch (350 mm through 1,200 mm) for Water Transmission and Distribution.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 LARGE PVC PRESSURE PIPE

A. Large PVC Pressure Piping

1. Unless otherwise noted, PVC pressure pipe for nominal diameters 4 inches and larger shall conform to the requirements of AWWA C900 DR 18 up to 12 inches with gasketed integral bell ends. Pipe shall be designed for maximum working pressure of not less than 150 psi. Pipe shall be made to ductile iron pipe ODs instead of IPS. The PVC pipe shall be blue and NSF approved for potable water use and green for sewer main use.

B. Bell and Spigot

1. Pipe joints shall be made with integral bell and spigot pipe ends. The bell shall consist of an integral thickened wall section designed to be at least as strong as the pipe wall. The bell shall be supplied with a factory glued rubber ring gasket that conforms to the manufacturer's standard

dimensions and tolerances. The gasket shall meet the requirements of ASTM F477 "Elastomeric Seals (Gaskets) for Joining Plastic Pipe." PVC joints shall be "Ring-Tite" as manufactured by J-M Manufacturing Company, Inc. or an equal approved by the Engineer. Nontoxic gasket lubricant shall be as specified by the pipe manufacturer.

C. Restrained Joints

1. The following pipe joints and fittings restraint methods can be used to prevent pipe joints and fittings from separating under pressure. No additional financial compensation will be provided to the Contractor for providing the following methods of restraint:

a. C-900 PVC pipe bell and spigot joints (4-inch- through 12-inch-diameter pipe) shall be restrained with the EBAA Iron MEGALUG® Series 1600 Restrainer or an equal approved by the Engineer. The Series 1600 restrainers shall provide a minimum of 150-psi restraint to DR 18 (Class 150) pipe with a 3 to 1 safety factor. The restraining device and tee head bolts shall be manufactured of high-strength ductile iron meeting ASTM A536, Grade 65-42-10. Clamping bolts and nuts shall be manufactured of corrosion-resistant, high-strength, low-alloy CORTEN steel meeting the requirements of ASTM A242/A242M.

b. Mechanical joint fittings used with PVC pipe (3-inch- through 36-inch-diameter DR 18 pipe) shall be restrained with the EBAA Iron MEGALUG® Series 2000 PV Restrainer or an equal approved by the Engineer. The Series 2000 PV restrainers shall provide a minimum of 150-psi restraint with a 2 to 1 safety factor. The restraining device and Tee head bolts shall be manufactured of high-strength ductile iron meeting ASTM A536, Grade 65-42-10. Clamping bolts and nuts shall be manufactured of corrosion-resistant, high-strength, low-alloy CORTEN steel meeting the requirements of ASTM A242/A242M.

c. All parts of the joint restraint systems shall be coated with coal tar epoxy as in Section 09900, Painting and Coating, Mega-Bond coating system by EBAA Iron, Inc. or Engineer-approved equal.

2.02 LARGE PVC PRESSURE PIPE FITTINGS

A. Fittings for use with large PVC pipe shall be ductile-iron fittings conforming to the requirements of mechanical joint fittings as specified in Section 15155, Ductile Iron Pipe and Fittings.

B. Exterior Coating

1. Exterior coating for fittings shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.

C. Lining

1. Lining for fittings shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.
2. Any damaged lined areas shall be repaired in accordance with the manufacturer's recommendations so that the repaired area is equal to the undamaged lined areas.

2.03 SMALL PVC PRESSURE PIPE (NOT USED)

PART 3 EXECUTION

3.01 EXAMINATION

A. The Contractor shall examine pipe and appurtenances shall be examined at the point of delivery. Material found to be defective due to manufacture or damage in shipment shall be rejected. Tests as specified in the applicable material standard may be performed to ensure conformance with the standard.

3.02 PIPE INSTALLATION

A. Proper implements, tools, and facilities shall be provided and used for the safe and convenient performance of the work. All pipe, fittings, and valves shall be lowered carefully into the trench using suitable tools or equipment to prevent damage to pipeline materials. Under no circumstances shall pipeline materials be dropped or dumped into the trench. The trench shall be dewatered before installing the pipe in accordance with the Specifications.

B. The sealing surface of the pipe, the inside of the bell, and the inside of the gasket shall be cleaned immediately before assembly.

C. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. During laying operations, no debris, tools, clothing, or other materials shall be placed in the pipe.

D. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.

E. At all times when pipe laying is in progress, except when joining another piece of pipe, the open ends of the pipe shall be closed by a watertight plug or other means approved by the Engineer to prevent the entrance of objectionable materials. Care shall be taken to prevent pipe flotation.

F. Trench width at the top of the pipe, bedding conditions, and backfill placement and compaction shall be in accordance with the Contract Documents.

G. Joint Assembly

1. Pipe joints shall be assembled in accordance with the manufacturer's instructions.

H. Pipe Deflection

1. When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane, the amount of deflecting shall not exceed 75% of that recommended by the manufacturer.

I. Pipe Cutting

1. Cutting pipe for the insertion of valves, fittings, or closure pieces shall be done in a neat, workman-like manner without creating damage to the pipe. Ends shall be cut square and perpendicular to the pipe axis.
2. Burrs shall be removed from spigots, and ends shall be smoothly beveled. Field cut ends shall be marked for proper depth of joint assembly.

J. Thrust Restraint

1. All pipe, tees, valves, bends, and etc., unless otherwise specified, shall be restrained using mechanical means as specified. Pipe restraint using the specified mechanical restraining system with the restrained joint schedule or tie-rods is also acceptable. Reaction blocking shall not be used on this project.
2. All ductile iron fittings, valves, mechanical restraint harnesses, and other forms of mechanical restraint shall be installed and wrapped in polyethylene tube material as specified in Section 15155, Ductile Iron Pipe and Fittings.

3.03 LOCATION AND IDENTIFICATION

A. All non-metallic potable water and sewer mains shall be installed with a continuous, insulated 14-gauge copper wire installed directly on top of pipe for

location purposes. Detectable tape may be used in lieu of copper wire and shall be placed 1 foot above the top of the pipe.

B. All PVC sewer mains shall be a solid green color. All potable water mains shall be a solid blue color. All lettering shall appear legibly on pipe and shall run the entire length of the pipe. Lettering shall be appropriate for the intended use.

3.04 TESTING

A. All lines shall be tested at the pressures listed in the Piping Schedule in the Drawings.

B. See Section 15144, Pressure Testing of Piping, for the requirements of pipe flushing, cleaning, pressure and leakage testing, and inspection requirements.

C. See Section 15141, Disinfection of Piping and Water Storage Facilities, for the disinfection requirements.

END OF SECTION

APPENDIX A

REPORT OF A GEOTECHNICAL EXPLORATION

Engineering & Consulting, Inc.

SUMMARY REPORT OF A GEOTECHNICAL SITE EXPLORATION

NORTH SIDE LS PHASE 3
ZEPHYRHILLS, PASCO COUNTY, FLORIDA

GSE PROJECT NO. 16200

Prepared For:

JONES EDMUNDS & ASSOCIATES, INC.

SEPTEMBER 2023

GSE Engineering & Consulting, Inc.

September 8, 2023

Keyla Virgilio, E.I.
Jones Edmunds & Associates, Inc.
730 NE Waldo Road
Gainesville, Florida 32641

Subject: Summary Report of a Geotechnical Site Exploration
North Side LS Phase 3
Zephyrhills, Pasco County, Florida
GSE Project No. 16200

GSE Engineering & Consulting, Inc. (GSE) is pleased to submit this geotechnical site exploration report for the above referenced project.

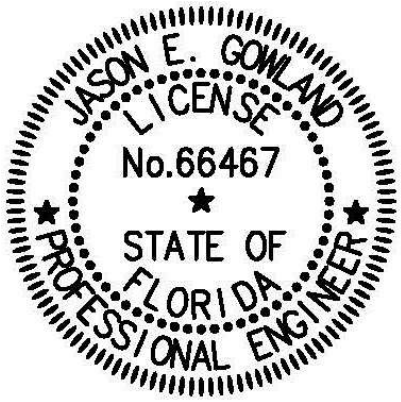
Presented herein are the findings and conclusions of our exploration, including the geotechnical parameters and recommendations to assist with the force main and water main designs.

GSE appreciates this opportunity to have assisted you on this project. If you have any questions or comments concerning this report, please contact us.

Sincerely,

GSE Engineering & Consulting, Inc.





This item has been digitally signed and sealed by

on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Kevin P. Fisher, E.I.
Staff Engineer

Jason E. Gowland, P.E.
Principal Engineer
Florida Registration No. 66467

KPF / JEG: tlf
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1. Project Site Location Map
2. Site Plan Showing Approximate Locations of Field Tests

1.0 INTRODUCTION

1.1 General

GSE Engineering & Consulting, Inc. (GSE) has completed this geotechnical exploration for the proposed North Side LS Phase 3 located in Zephyrhills, Pasco County, Florida. This exploration was performed in accordance with GSE Proposal No. 2023-440 (Rev. 1) dated July 25, 2023. You authorized our services on July 26, 2023.

1.2 Project Description

This project will consist of a new force main on Ft. King Road and a force main and water main on Kossik Road. You provided information about the project including site plans illustrating the proposed force main and water main alignments and requested soil boring locations.

A proposed 6-inch diameter force main on Ft. King Road will be installed using horizontal direction drill (HDD) and conventional open trench methods. The force main will be located in the western Ft. King Road right-of-way.

A proposed 6-inch force main and a 12-inch water main are proposed along Kossik Road. Beginning at Ft. King Road, both mains will be located in the north right-of way. East of Lov Lane, the water main will transition to the south right-of way. The force main and water main will be constructed using both HDD and conventional open trench methods.

A recent aerial photograph of the site was obtained. The site plan and aerial photograph were used in preparation of this exploration and report.

1.3 Purpose

The purpose of this geotechnical exploration was to determine the general subsurface conditions, evaluate these conditions with respect to the proposed construction, and prepare geotechnical parameters and recommendations to assist with the force main and water main designs.

2.0 FIELD AND LABORATORY TESTS

2.1 General Description

The procedures used for field sampling and testing are in general accordance with industry standards of care and established geotechnical engineering practices for this geographic region. This exploration consisted of performing eleven (11) Standard Penetration Test (SPT) borings to depths of 10 feet below land surface (bls) along the force main and water main alignments.

The soil borings were performed at the approximate locations as shown on Figure 2. The borings were located at the site using the provided site plan and obvious site features as reference. The boring locations should be considered approximate. The soil borings were performed from August 21 through 24, 2023.

2.2 Standard Penetration Test Borings

The soil borings were performed with a drill rig employing flight auger drilling techniques and Standard Penetration Testing (SPT) in accordance with ASTM D1586. The SPTs were performed continuously to 10 feet and at 5-foot intervals thereafter. Soil samples were obtained at the depths where the SPTs were performed. The soil samples were classified in the field, placed in sealed containers, and returned to our laboratory for further evaluation.

After drilling to the sampling depth, the standard two-inch O.D. split-barrel sampler was seated by driving it 6 inches into the undisturbed soil. Then the sampler was driven an additional 12 inches by blows of a 140-pound hammer falling 30 inches. The number of blows required to produce the next 12 inches of penetration were recorded as the penetration resistance (N-value). These values and the complete SPT boring logs are provided in Section 5.1.

Upon completion of the sampling, the boreholes were abandoned in accordance with Water Management District guidelines.

2.3 Soil Laboratory Tests

The soil samples recovered from the soil borings were returned to our laboratory, and examined to confirm the field descriptions. Representative samples were then selected for laboratory testing. The laboratory tests consisted of eight (8) percent soil fines passing the No. 200 sieve determinations, eight (8) natural moisture content determinations, and two (2) corrosion series tests. These tests were performed in order to aid in classifying the soils and to further evaluate their engineering properties. The laboratory tests are provided in Section 5.2.

3.0 FINDINGS

3.1 Surface Conditions

Mr. Kevin P. Fisher, E.I. with GSE visited the site on August 2, 2023 to observe the site conditions and mark the boring locations. Mr. Fisher returned to the site on August 17, 2023 to re-mark several boring locations where the stakes went missing.

One force main will be located in the western Ft. King Road right-of-way. The other force main and water main will be located along Kossik Road. Beginning at Ft. King Road, both mains will be located in the north right-of way. East of Lov Lane, the water main will transition to the south right-of way.

The topography at the site is moderately sloping down towards Cass Road from the west and east. Regional topography is rolling hills. The provided site plans indicate the ground surface elevations across the site are near elevations 82 to 127 feet[1].

3.2 Subsurface Conditions

The locations of the SPT borings are provided on Figure 2. Complete logs for the borings are provided in Section 5.1. Descriptions for the soils encountered are accompanied by the Unified Soil Classification System symbol (SM, SP-SM, etc.) and are based on visual examination of the recovered soil samples and the laboratory tests performed. Stratification boundaries between the soil types should be considered approximate, as the actual transition between soil types may be gradual.

The SPT borings located along the proposed force main and water main indicate the soils across these areas are relatively consistent. The auger borings initially penetrated 2 to 10 feet of a near-surface sandy stratum consisting of poorly graded sand and sand with silt (SP, SP-SM). This was underlain by clayey to very clayey sand, sand with clay, and silty clayey sand (SC, SC/CL, SP-SC, SM-SC) to the explored depths of 10 feet bls.

The poorly graded sand and sand with silt (SP, SP-SM) is generally in a very loose to loose condition with N-values ranging from 4 to 9 blows per foot. The underlying clayey to very clayey sand, sand with clay, and silty clayey sand (SC, SC/CL, SP-SC, SM-SC) is generally in a loose to medium dense condition with N-values ranging from 5 to 12 blows per foot.

The groundwater table was encountered in the SPT borings A-9 and A-10 at depths ranging from 6 to 9 feet bls at the time of our investigation.

3.3 Review of Published Data

The majority of the site is mapped as eight soil series by the Soil Conservation Service (SCS) Soil Survey for Pasco County[2]. The following soil descriptions are from the Soil Survey.

Tavares sand, 0 to 5 percent slopes - This nearly level to gently sloping, moderately well drained soil is on low ridges and knolls throughout the county. Areas are irregular in shape.

---

[1] Northside Lift Station Phase 3, Kossik Road Planview, Jones Edmunds Project No. 26110-053-01, April 2023

[2] Soil Survey of Pasco County, Florida. Soil Conservation Service, U.S. Department of Agriculture.

The soil is sand to a depth of 80 inches or more.

Typically, the surface later is very dark gray sand about 3 inches thick. Below this, layers of yellowish brown and light yellowish brown sand extend to a depth of 56 inches. Below this is a layer of very pale brown sand 20 inches thick, and below this, white sand extends to a depth of 80 inches or more.

Included with this soil in mapping are small areas of Adamsville, Astatula, and Candler soils. Also included are small areas of Millhopper and Sparr soils and, along rivers, a few areas of soils that occasionally are flooded. The included soils make up about 10 percent of the map unit.

In most years, under natural conditions, the water table is at a depth of 40 to 60 inches for 6 to 12 months and below 60 inches during very dry periods. The available water capacity is very low. Permeability is very rapid. Natural fertility is low.

Sparr fine sand, 0 to 5 percent slopes - This nearly level to gently sloping, somewhat poorly drained soil is on seasonally wet uplands. Slopes are smooth to concave. Areas are irregular in shape.

Typically, the surface layer is dark gray fine sand about 6 inches thick. The subsurface layer is about 37 inches thick. It is grayish brown fine sand in the upper 5 inches, pale brown fine sand in the next 24 inches, and light yellowish brown fine sand in the lower 8 inches. The subsoil is light yellowish brown sandy clay loam to a depth of about 80 inches.

Included with this soil in mapping are similar soils that have over 5 percent plinthite in the subsoil. Also included are small areas of Arredondo, Millhopper, Nobleton, and Tavares soils and a few areas along river that are occasionally flooded. The included soils make up about 15 percent of the map unit.

This Sparr soil has a water table, commonly perched above the subsoil, at a depth of 20 to 40 inches for 1 to 4 months during most years. The available water capacity is low in the surface and subsurface layers and is medium to high in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil.

Adamsville fine sand - This nearly level, somewhat poorly drained soil is on low broad flats that are less than 2 feet higher in elevation than the adjacent sloughs. Individual areas are irregular in shape and range from 5 to 200 acres. Slopes are less than 2 percent.

Typically, the surface layer is very dark gray fine sand about 3 inches thick. The subsurface layer is grayish brown fine sand 5 inches thick. The underlying material to a depth of 80 inches or more is fine sand. It is very pale brown to a depth of about 23 inches, light gray to a depth of 57 inches, and white below 57 inches.

Included with this soil in mapping are small areas of Narcoossee, Tavares, and Zolfo soils. Also included, along rivers, are a few areas of soils that occasionally are flooded. The included soils generally make up less than 10 percent of the map unit.

In most years, under natural conditions, the water table is at a depth of 20 to 40 inches for 2 to 6 months; but it may rise to within 20 inches of the surface for less than 2 weeks during very wet seasons. It recedes to a depth of more than 40 inches during dry periods. In this soil, available water capacity is low to very low. Natural fertility is low. Permeability is rapid.

Lake fine sand, 0 to 5 percent slopes - This nearly level to gently sloping, excessively drained soil is along ridgetops and on low hillsides in the uplands. Slopes are smooth to concave.

Typically, the surface layer is dark grayish brown fine sand about 8 inches thick. The next 52 Inches Is yellowish brown fine sand. Below this, and extending to a depth of more than 80 inches, is brownish yellow fine sand.

Included with this soil in mapping are small areas of Arredondo, Candler, Orlando, and Tavares soils. The included soils make up less than 15 percent of the map unit.

Permeability is rapid throughout the soil, and the water table is below a dep1h of 120 inches. The available water capacity is very low in all layers. The natural fertility and organic matter content are both low.

Arredondo fine sand, 0 to 5 percent slopes - This nearly level to gently sloping, well drained soil is on uplands. Individual areas are irregular in shape. Slopes are smooth to concave.

Typically, the surface layer consists of dark grayish brown fine sand about 5 inches thick and dark gray fine sand about 3 inches thick. The subsurface layer is about 50 inches thick. It is yellowish brown fine sand in the upper 10 inches and light yellowish brown fine sand in the remaining 40 inches. The subsoil is brownish yellow fine sand in the upper 5 inches. In the next 9 inches it is yellowish brown sandy clay loam mottled with red. Below that to a depth of 87 inches or more, is light yellowish brown sandy clay loam that is mottled.

Included with this soil in mapping are similar soils in which plinthite makes up more than.5 percent of the subsoil. Also included are small areas of Candler, Kendrick, Lake, Millhopper, and Sparr soils. The included soils make up about 15 percent of the map unit.

In this Arredondo soil, the available water capacity is low in the surface and subsurface layers and is high in the subsoil. Permeability is rapid in the surface and subsurface layers and is moderate or moderately rapid in the subsoil. Natural fertility is low.

Kendrick fine sand, 0 to 5 percent slopes - This well drained, nearly level to gently sloping soil is on uplands. Areas are large to small and are irregular in shape. Slopes are smooth to concave.

Typically, the surface layer is dark grayish brown fine sand about 7 inches thick. Next is a layer of fine sand about 21 inches thick. It is yellowish brown and brownish yellow in the lower 14 inches. The subsoil extends to a depth of 73 inches. In the upper 4 inches it is yellowish brown sandy clay loam. In the upper 14 inches it is mottled, yellowish brown sandy clay loan, and in the next 27 inches it is mottled, brownish yellow sandy clay loam. Below this to a depth of about 80 inches is mixed very pale brown, reddish yellow, and pink sandy clay loam.

Included with this soil in mapping are small areas of Arredondo, Blichton, and Nobleton soils. Also included are small areas of Kendrick soils that have slopes of 5 to 8 percent. The included areas make up about 15 percent of the map unit.

The water table is below a depth of 72 inches. The available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Natural fertility is medium. Permeability is rapid above the subsoil and moderate in the subsoil.

Kanapaha fine sand, 0 to 5 percent slopes - This nearly level to gently sloping, poorly drained soil is in low positions on uplands. Slopes are smooth to concave.

Typically, the surface layer is very dark gray fine sand 6 inches thick. The subsurface layer is fine sand about 66 inches thick. It is light brownish gray in the upper 7 inches, light gray in the next 32 inches, and white in the lower 27 inches. The subsoil extends below a depth of 80 inches. It is light brownish gray fine sandy loam.

Included with this soil in mapping are soils that are similar but differ by having a brownish stained subsurface layer or more than 6 percent plinthite in the subsoil. Also included are small areas of Blichton, Nobleton, and Sparr soils. Included soils make up less than 15 percent of any mapped area.

In most years, under natural conditions, this soil has a water table at a depth of less than 10 inches for 1 to 3 months and between depths of 10 and 40 inches for 3 to 4 months. In drier seasons, the water table recedes to a depth of more than 40 inches. The available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and is moderately slow in the subsoil.

Millhopper fine sand, 0 to 5 percent slopes - This nearly level to gently sloping, moderately well drained soil is on uplands. Individual areas are irregular in shape. Slopes are smooth to concave.

Typically, the surface layer is fine sand 7 inches thick. It is dark gray in the upper 3 inches and grayish brown below. The subsurface layer is fine sand and extends to a depth of about 59 inches. It is very pale brown to a depth of 42 inches and then changes to light yellowish brown. Below this, and extending to a depth of 80 inches or more, is the subsoil. It is yellowish brown fine sandy loam in the upper 5 inches and gray sandy clay loam below.

Included with this soil in mapping are similar soils on similar landscape positions. They differ slightly by containing more very fine sand in the surface and subsurface layers. Small areas of these soils are in several parts of the county, but are concentrated in the north-central part. Also included in mapping are small areas of Arredondo, Candler, Kendrick, Nobleton, Sparr, and Tavares soils. The included soils make up about 15 percent of the map unit.

In an unaltered state, this soil has a water table perched above the loamy horizon. The water is at a depth of 40 to 60 inches for 1 to 4 months and at a depth of 60 to 72 inches for 2 to 4 months in most years. In very wet years, the water table may be at a depth of 30 to 40 inches for a cumulative period of 1 to 3 weeks. The available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil.

3.4 Laboratory Soil Analysis

Selected soil samples recovered from the soil borings were analyzed for the percent soil fines passing the No. 200 sieve, natural moisture content, and corrosion series. Samples selected for laboratory testing were collected at depths ranging from 0 to 6 feet bls. These tests were performed to confirm visual soil classification and evaluate their engineering properties. The complete laboratory report is provided in Section 5.2.

The laboratory tests indicate the tested soils consist of sand with silt, silty clayey sand, clayey sand, and very clayey sand. The tested sand with silt (SP-SM) contains approximately 5.7 to 10 percent soil fines passing the No. 200 sieve with natural moisture contents of about 3.3 to 6.7 percent. The tested silty clayey sand (SM-SC) contains approximately 22 percent soil fines passing the No. 200 sieve with a natural moisture content of about 25 percent. The tested clayey sand (SC) contains approximately 20 to 21 percent soil fines passing the No. 200 sieve with natural moisture contents of about 13 to 15 percent. The tested very clayey sand (SC/CL) contains approximately 32 percent soil fines passing the No. 200 sieve with a natural moisture content of about 14 percent.

Two (2) soil samples were collected and analyzed for corrosion series testing. One soil sample was collected from SPT boring A-1 from 2 to 6 feet bls, while the other was collected from SPT boring A-2 from 2 to 6 feet bls. The soil sample from A-1 had a resistivity of 55,000 (ohm-cm) and the soil sample from A-2 had a resistivity of 22,000 (ohm-cm). The chloride contents of the tested samples were below detectable limits (BDL) for the soil samples from A-1 and A-2. The sulfate contents of the tested sampled were 24 and BDL for the soil samples from A-1 and A-2, respectively. The pH's of the tested samples were 5.33 and 8.04 for A-1 and A-2, respectively. The soils at the site are considered slightly to moderately aggressive for concrete[3]. The soils at the site are considered slightly to extremely aggressive for steel.

[3] Structures Design Guidelines, FDOT Structures Manual, Volume 1, January 2018, Table 1.3.2-1, p. 1-6.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General

The following recommendations are made based upon our understanding of the proposed construction, a review of the attached soil borings and laboratory test data, and experience with similar projects and subsurface conditions. If plans or the location of proposed construction changes from those discussed previously, GSE requests the opportunity to review and possibly amend our recommendations with respect to those changes.

The performance of site improvements may be sensitive to their post-construction relationship to site groundwater levels, seepage zones, or soil/rock characteristics exposed at final site grades. GSE recommends that use of boring information for final design of all site improvements be predicated on proper horizontal and vertical control of borings.

In this section of the report, we present our geotechnical parameters and recommendations to assist with the force main and water main designs as well as our general site preparation guidelines.

4.2 Groundwater

The groundwater table was encountered in SPT borings A-9 and A-10 at depths ranging from 6 to 9 feet bls at the time of our exploration. However, you should expect water to be at a depth of 1.5 and 9 feet bls at boring locations A-9 and A-10, respectively, after periods of heavy and seasonal rainfall.

4.3 Trench Excavation

Based on the information provided, we understand that the force main and water main will be constructed using trench and trenchless methods. The following subsections provide information for the design and construction of the force main and water main and excavations required for the proposed installation.

4.3.1 General

It is likely that auger pits will be required at certain locations to install the force main and water main. For design, the groundwater level should be assumed to exist at the seasonal high groundwater level since these conditions may exist after a heavy rain event. Geotechnical parameters were developed for the design of pit construction as part of the proposed force main and water main.

4.3.2 Geotechnical Parameters

Based on the soil conditions encountered by the borings, geotechnical design parameters were developed for the soils encountered across the site for the design of pit construction or horizontal directional drilling. These design parameters are provided in Table 1 below.

Table 1: Geotechnical Design Soil Parameters						
Boring No.	Range of Depths (ft bls)	Internal Friction Angle ϕ (degrees)	Moist Unit Weight γ (pcf)	Submerged Unit Weight γ (pcf)	Unconfined Compression q_u (ksf)	Cohesion c_u (ksf)
A-1	0 - 2	-	-	-	-	-
	2 - 10	30	112	50	-	-
A-2	0 - 8	29	92	30	-	-
	8 - 10	29	111	49	-	-
A-3	0 - 6	30	111	49	-	-
	6 - 10	28	115	53	-	-
A-4	0 - 6	29	90	28	-	-
	6 - 8	30	98	36	-	-
	8 - 10	28	111	49	-	-
A-5	0 - 4	-	-	-	-	-
	4 - 10	26	97	35	-	-
A-6	0 - 4	-	-	-	-	-
	4 - 8	30	100	38	-	-
	8 - 10	27	111	49	-	-
A-7	0 - 4	-	-	-	-	-
	4 - 10	30	114	52	-	-
A-8	0 - 10	30	101	39	-	-
A-9	0 - 10	30	107	45	-	-
A-10	0 - 10	30	103	41	-	-
A-11	0 - 8	30	100	38	-	-
	8 - 10	30	103	41	-	-

4.3.3 Excavation Stability

The open excavations may be shored or laid back to a stable slope or supported by some other equivalent means used to provide safety for workers and adjacent structures, if any. The excavations should be made in accordance with OSHA Standards, OSHA 2207, Subpart P, latest revision.

- Excavations less than 5 feet below land surface (bls) – Excavations that are less than 5 feet in depth should be effectively protected when an indication of ground movement is anticipated.
- Excavations greater than 5 feet bls – Excavations that are deeper than 5 feet should be sloped, shored, sheeted, braced, or laid back to a stable slope or supported by some other equivalent means or protection such that workers are not exposed to moving ground or cave-ins. The slopes and shoring should be in accordance with trench safety requirements as per OSHA Standards. For shoring greater than 20 feet (if needed), an engineering evaluation is required.

The excavation pits should be backfilled in accordance with the project specifications. It is likely the excavated material may be used as backfill material provided it meets the requirements of Section 4.7. Fill Suitability of this report. We recommend that the backfill be placed in maximum 12-inch loose lifts that are compacted to at least 95 percent of the Modified Proctor maximum dry density.

4.4 Trenchless Installation

We understand that portions of the proposed force main and water main will be installed using trenchless methods. Based on the soil conditions encountered, we recommend the geotechnical design parameters provided in Table 1 be used. GSE recommends that appropriate earth pressures be determined for the auger casing.

Carrier pipe must be sufficiently strong to withstand anticipated long-term ground loads and must not be subject to deterioration by substance either in the ground or in the casing. The carrier pipe design should include consideration of not only the loads applied to the pipe, but also factors other than soil loading. These factors could include minimum structural code requirements, loading from pipe jacking operations, and other construction loads. The geotechnical design parameters given in Table 1 should be used in analyzing the soil structure interaction of the carrier pipe.

4.5 Site Preparation

The soils at this site should be suitable for supporting the proposed construction using normal, good practice site preparation procedures. The following recommendations are our general guidelines for site preparation.

4.5.1 Stripping

If required, strip the construction limits and 10 feet beyond the perimeter of all grass, roots, topsoil, and other deleterious materials. You should expect to strip to depths of 12 or more inches. Deeper stripping may be necessary if major root systems are present at the site.

4.5.2 Dewatering

Temporary dewatering is not expected to be necessary for this project. However, if needed, we anticipate dewatering can be accomplished with sumps placed near the construction area, or with underdrains connected to a vacuum pump.

In any case, the site should always be graded to promote runoff and limit the amount of ponding. Localized ponding of stormwater is expected without proper grading during construction, and could render previously acceptable surfaces unacceptable.

4.5.3 Proof-Rolling

If required for slabs on grade or above ground improvements, proof-roll the subgrade with heavy rubber-tired equipment, such as a loaded front-end loader or dump truck, to identify any loose or soft zones not found by the soil borings. The proof-rolling should be monitored by a geotechnical engineer or qualified technician. Undercut or otherwise treat these zones as recommended by the geotechnical engineer in this report.

4.5.4 Fill Placement

Imported fill placed to raise the site grades or backfill for trenches should consist of clean sand having less than 10 percent passing the No. 200 sieve. On-site soils meeting the requirements of Section 4.7 may also be used as structural fill. The fill should be placed in maximum 12-inch loose lifts that are compacted to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557). If lighter “walk-behind” compaction equipment is used, this may require lifts of 4 inches or less to achieve the required degree of compaction.

4.6 Quality Control and Construction Materials Testing

It should be noted that the geotechnical engineering design does not end with the advertisement of the construction documents. As the geotechnical engineer of record, GSE is the most qualified to perform the construction materials testing that will be required for this project. The benefits of having the geotechnical engineer of record also perform the construction materials testing are numerous. If GSE continues to be involved with the project through construction, we will be able to constantly re-evaluate and possibly alter our geotechnical recommendations in a timely and cost effective manner once final design and construction techniques are developed. This often results in cost savings for the project.

4.7 Fill Suitability

The soils encountered at this site within the explored depths range from sands (SP) to very clayey sands (SC/CL). A discussion of the suitability for reuse as structural fill for each soil classification according to the Unified Soil Classification System (USCS) designation is provided below.

SP, SP-SM – Sands (SP) and sand with silt (SP-SM) have less than 5 percent and 12 percent soil fines passing the No. 200 sieve, respectively, and are typically well draining soils that are suitable for reuse as structural fill. The sands with silt may require moisture conditioning (drying) to make the material more workable. These soils will require stockpiling and drying before they are reused if they are excavated from below the water table.

SM – Silty sands (SM) can have between 12 percent and 50 percent soil fines passing the No. 200 sieve. Silty sands are typically non-plastic or have low plasticity, and can be reused as structural fill with precautions. Silty sands can be moisture sensitive and difficult to work and compact and can rut if the moisture content is near or above the optimum moisture content. We recommend these soils be moisture conditioned (dried) so that the moisture content during use is at or below the optimum moisture content. Aerating and exposure to the sun is typically the most effective methods of drying these soils. It may not be practical to reuse these materials during the wet season, as frequent rain showers may not allow these soils to dry to a workable moisture content. Suitable silty sands are limited to soil having less than 30 percent soil fines passing the No. 200 sieve. Silty sands with more than 30 percent soil fines are especially moisture sensitive, and are not recommended for reuse as structural fill. These soils will behave more as sandy silt, and for this reason, very silty sands having more than 30 percent soil fines passing the No. 200 sieve have been assigned a dual classification of SM/ML. Silty sand soils that are excavated from below the water table are not recommended for reuse as structural fill due to the amount of time that will be required to dry these soils to a workable condition.

SC – Clayey sand (SC) soils can have between 12 percent and 50 percent soil fines passing the No. 200 sieve. Clayey sands can have a high range of plasticity, varying from a PI of 7 or greater and plotting above the A-line to highly plastic. Friable clayey sands are typically suitable for use as structural fill with precautions. Clayey sands will be moisture sensitive and difficult to work and compact and can rut during placement if the moisture content is near or above the natural moisture content. We recommend these soils be moisture conditioned (dried) so that the moisture content during use is at or below the optimum moisture content. Aerating and exposure to the sun is typically the most effective methods of drying these soils. It may not be practical to reuse these materials during the wet season, as frequent rain showers may not allow these soils to dry to a workable moisture content. Suitable clayey sands are limited to soil having less than 30 percent soil fines passing the No. 200 sieve. Clayey sands with more than 30 percent soil fines passing the No. 200 sieve are especially moisture sensitive and are typically highly plastic, and are not recommended for reuse as structural fill. These soils will behave more as sandy clay, and for this reason, very clayey sands having more than 30 percent soil fines passing the No. 200 sieve have been assigned a dual classification of SC/CH or SC/CL. Clayey sand soils that are excavated from below the water table are not recommended for reuse as structural fill due to the amount of time that will be required to dry these soils to a workable condition.

ML, MH, CL, CH – Silts and clays are not suitable materials for reuse as structural fill.

When using on-site soils as fill materials, we recommend the silty and clayey sand soils (SM, SC) be used in the lower depths of the fill. Sand and sand with silt (SP, SP-SM) should be used in the upper portions of the fill. We recommend a minimum of 2 feet of sand (SP, SP-SM) cover the silty and clayey sand fill materials to reduce the potential for soggy surface conditions due to the low permeability characteristics of the silty and clayey sand materials.

5.0 FIELD DATA

5.1 Standard Penetration Test Soil Boring Logs

GSE Engineering & Consulting, Inc.
GSE Engineering
5590 SW 64th St
Gainesville, FL 32608
Telephone: 3523773233

BORING NUMBER A-1

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME North Side LS Phase 3
PROJECT NUMBER 16200
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** NE
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** >10 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Dark brown SAND with silt	2	AU 1							
2.5		(SC/CL) Loose to medium dense orange very clayey SAND		AU 2							
		pH = 5.33 *R = 55000* *Cl= BDL* *S = 24*		SPT 3	3-4-4-5 (8)				32	14	
5.0				SPT 4	5-5-4-5 (9)						
7.5				SPT 5	5-5-6-6 (11)						
10.0			10								
		Bottom of borehole at 10.0 feet.									

SPT BORINGS - GINT STD US.GDT - 9/8/23 09:13 - Q:\PROJECTS\16200 NORTH SIDE LS PHASE 3\16200 BORINGS\16200 BORINGS.GPJ

GSE Engineering & Consulting, Inc.
GSE Engineering
5590 SW 64th St
Gainesville, FL 32608
Telephone: 3523773233

BORING NUMBER A-2

CLIENT Jones Edmunds & Associates, Inc. **PROJECT NAME** North Side LS Phase 3

PROJECT NUMBER 16200 **PROJECT LOCATION** Zephyrhills, Pasco County, Florida

DATE STARTED _____ **COMPLETED** _____ **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR Watson's Drilling, LLC **GROUND WATER LEVELS:**

DRILLING METHOD Flight Auger ▼ **AT TIME OF DRILLING** NE

LOGGED BY LBW **CHECKED BY** KPF ▽ **ESTIMATED SEASONAL HIGH** >10 ft

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Brown SAND with silt		AU 1							
			2								
2.5		(SP-SM) Very loose to loose pale brown SAND with silt		AU 2							
		pH = 8.04 *R = 22000* *Cl = BDL* *S = BDL*		SPT 3	2-3-2-2 (5)				7.4	5.8	
5.0											
				SPT 4	3-2-2-3 (4)						
7.5			8								
		(SC) Medium dense orange clayey SAND		SPT 5	4-5-6-7 (11)						
10.0			10								
		Bottom of borehole at 10.0 feet.									

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GSE Engineering
5590 SW 64th St
Gainesville, FL 32608
Telephone: 3523773233

BORING NUMBER A-3

CLIENT Jones Edmunds & Associates, Inc. **PROJECT NAME** North Side LS Phase 3

PROJECT NUMBER 16200 **PROJECT LOCATION** Zephyrhills, Pasco County, Florida

DATE STARTED _____ **COMPLETED** _____ **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR Watson's Drilling, LLC **GROUND WATER LEVELS:**

DRILLING METHOD Flight Auger ▼ **AT TIME OF DRILLING** NE

LOGGED BY LBW **CHECKED BY** KPF ▽ **ESTIMATED SEASONAL HIGH** >10 ft

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Loose brown SAND with silt		AU 1							
2.5				AU 2					5.7	3.3	
5.0				SPT 3	3-4-5-4 (9)						
			6								
		(SC) Loose to medium dense orange clayey SAND		SPT 4	4-5-4-4 (9)						
7.5				SPT 5	5-6-5-5 (11)						
10.0			10								
		Bottom of borehole at 10.0 feet.									

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GSE Engineering & Consulting, Inc.
GSE Engineering
5590 SW 64th St
Gainesville, FL 32608
Telephone: 3523773233

BORING NUMBER A-4

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME North Side LS Phase 3
PROJECT NUMBER 16200
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH >10 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Very loose brown SAND with silt		AU 1							
2.5				AU 2							
5.0			6	SPT 3	3-2-2-3 (4)						
7.5		(SP-SC) Loose orange SAND with clay	8	SPT 4	4-3-3-8 (6)						
10.0		(SC) Loose orange clayey SAND	10	SPT 5	4-4-5-4 (9)						
		Bottom of borehole at 10.0 feet.									

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GSE Engineering
5590 SW 64th St
Gainesville, FL 32608
Telephone: 3523773233

BORING NUMBER A-5

CLIENT Jones Edmunds & Associates, Inc. **PROJECT NAME** North Side LS Phase 3

PROJECT NUMBER 16200 **PROJECT LOCATION** Zephyrhills, Pasco County, Florida

DATE STARTED _____ **COMPLETED** _____ **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR Watson's Drilling, LLC **GROUND WATER LEVELS:**

DRILLING METHOD Flight Auger ▼ **AT TIME OF DRILLING** NE

LOGGED BY LBW **CHECKED BY** KPF ▽ **ESTIMATED SEASONAL HIGH** >10 ft

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Brown SAND with silt	2	AU 1							
2.5		(SP) Pale brown SAND	4	AU 2							
5.0		(SC) Loose pale brown clayey SAND		SPT 3	2-3-2-2 (5)				20	15	
7.5				SPT 4	3-3-2-3 (5)						
10.0			10	SPT 5	4-4-3-4 (7)						
		Bottom of borehole at 10.0 feet.									

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GSE Engineering
5590 SW 64th St
Gainesville, FL 32608
Telephone: 3523773233

BORING NUMBER A-6

CLIENT Jones Edmunds & Associates, Inc. **PROJECT NAME** North Side LS Phase 3

PROJECT NUMBER 16200 **PROJECT LOCATION** Zephyrhills, Pasco County, Florida

DATE STARTED _____ **COMPLETED** _____ **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR Watson's Drilling, LLC **GROUND WATER LEVELS:**

DRILLING METHOD Flight Auger ▼ **AT TIME OF DRILLING** NE

LOGGED BY LBW **CHECKED BY** KPF ▽ **ESTIMATED SEASONAL HIGH** >10 ft

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SC) Orange clayey SAND		AU 1					21	13	
2.5				AU 2							
			4								
		(SP-SC) Loose orange SAND with clay		SPT 3	2-3-3-2 (6)						
5.0											
				SPT 4	4-3-4-4 (7)						
7.5			8								
		(SC) Loose orange clayey SAND		SPT 5	4-4-5-4 (9)						
10.0			10								
		Bottom of borehole at 10.0 feet.									

SPT BORINGS - GINT STD US.GDT - 9/8/23 09:13 - Q:\PROJECTS\16200 NORTH SIDE LS PHASE 3\16200 BORINGS\16200 BORINGS.GPJ

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GSE Engineering
5590 SW 64th St
Gainesville, FL 32608
Telephone: 3523773233

BORING NUMBER A-7

CLIENT Jones Edmunds & Associates, Inc. **PROJECT NAME** North Side LS Phase 3

PROJECT NUMBER 16200 **PROJECT LOCATION** Zephyrhills, Pasco County, Florida

DATE STARTED _____ **COMPLETED** _____ **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR Watson's Drilling, LLC **GROUND WATER LEVELS:**

DRILLING METHOD Flight Auger ▼ **AT TIME OF DRILLING** NE

LOGGED BY LBW **CHECKED BY** KPF ▽ **ESTIMATED SEASONAL HIGH** >10 ft

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Dark brown SAND with silt		AU 1							
2.5			4	AU 2							
5.0		(SM-SC) Loose to medium dense brown silty clayey SAND		SPT 3	3-4-4-5 (8)				22	25	
7.5				SPT 4	5-5-4-5 (9)						
10.0			10	SPT 5	5-6-6-5 (12)						
		Bottom of borehole at 10.0 feet.									

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GSE Engineering
5590 SW 64th St
Gainesville, FL 32608
Telephone: 3523773233

BORING NUMBER A-8

CLIENT Jones Edmunds & Associates, Inc. **PROJECT NAME** North Side LS Phase 3

PROJECT NUMBER 16200 **PROJECT LOCATION** Zephyrhills, Pasco County, Florida

DATE STARTED _____ **COMPLETED** _____ **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR Watson's Drilling, LLC **GROUND WATER LEVELS:**

DRILLING METHOD Flight Auger ▼ **AT TIME OF DRILLING** NE

LOGGED BY LBW **CHECKED BY** KPF ▽ **ESTIMATED SEASONAL HIGH** >10 ft

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SC) Loose brown SAND with clay		AU 1							
2.5				AU 2							
5.0				SPT 3	2-3-3-4 (6)						
7.5				SPT 4	4-3-3-4 (6)						
10.0			10	SPT 5	5-4-4-5 (8)						
		Bottom of borehole at 10.0 feet.									

SPT BORINGS - GINT STD US.GDT - 9/8/23 09:13 - Q:\PROJECTS\16200 NORTH SIDE LS PHASE 3\16200 BORINGS\16200 BORINGS.GPJ

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GSE Engineering
5590 SW 64th St
Gainesville, FL 32608
Telephone: 3523773233

BORING NUMBER A-9

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME North Side LS Phase 3
PROJECT NUMBER 16200
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING 9.0 ft
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 9.0 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Brown SAND with silt		AU 1							
2.5				AU 2					8.3	5.3	
			4								
		(SP) Loose pale brown SAND		SPT 3	3-4-3-4 (7)						
5.0											
				SPT 4	4-5-4-4 (9)						
7.5											
				SPT 5	3-4-4-3 (8)						
10.0			10								
		Bottom of borehole at 10.0 feet.									

SPT BORINGS - GINT STD US.GDT - 9/8/23 09:13 - Q:\PROJECTS\16200 NORTH SIDE LS PHASE 3\16200 BORINGS\16200 BORINGS.GPJ

GSE Engineering & Consulting, Inc.
GSE Engineering
5590 SW 64th St
Gainesville, FL 32608
Telephone: 3523773233

BORING NUMBER A-10

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME North Side LS Phase 3
PROJECT NUMBER 16200
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** 6.0 ft
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Loose dark brown SAND with silt		AU 1							
2.5				AU 2							
5.0			6	SPT 3	4-3-4-4 (7)						
7.5		(SP-SM) Loose brown SAND with silt		SPT 4	5-4-4-3 (8)						
10.0			10	SPT 5	4-3-3-4 (6)						
		Bottom of borehole at 10.0 feet.									

SPT BORINGS - GINT STD US.GDT - 9/8/23 09:13 - Q:\PROJECTS\16200 NORTH SIDE LS PHASE 3\16200 BORINGS\16200 BORINGS.GPJ

GSE Engineering & Consulting, Inc.
GSE Engineering
5590 SW 64th St
Gainesville, FL 32608
Telephone: 3523773233

BORING NUMBER A-11

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME North Side LS Phase 3
PROJECT NUMBER 16200
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** NE
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** >10 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0.0		(SP-SM) Brown SAND with silt		AU 1					10	6.7	
			2								
2.5		(SP) Loose pale brown SAND		AU 2							
5.0				SPT 3	2-2-3-2 (5)						
7.5				SPT 4	3-4-4-3 (8)						
			8								
10.0		(SP-SC) Loose pale brown SAND with clay		SPT 5	4-3-4-4 (7)						
			10								
		Bottom of borehole at 10.0 feet.									

SPT BORINGS - GINT STD US.GDT - 9/8/23 09:13 - Q:\PROJECTS\16200 NORTH SIDE LS PHASE 3\16200 BORINGS\16200 BORINGS.GPJ

5.2 Laboratory Results

GSE Engineering & Consulting, Inc.

SUMMARY REPORT OF LABORATORY TEST RESULTS

Project Number: 16200

Project Name: North Side LS Phase 3

Boring Number	Depth (ft)	Soil Description	Natural Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Percent Passing No. 200 Sieve	Organic Content (%)	Hydraulic Conductivity (ft/day)	Unified Soil Classification
A-1	2-6	Loose to medium dense orange very clayey SAND	14				32			SC/CL
A-2	2-6	Very loose to loose pale brown SAND with silt	5.8				7.4			SP-SM
A-3	2-4	Loose brown SAND with silt	3.3				5.7			SP-SM
A-5	4-6	Loose pale brown clayey SAND	15				20			SC
A-6	0-2	Orange clayey SAND	13				21			SC
A-7	4-6	Loose to medium dense brown silty clayey SAND	25				22			SM-SC
A-9	2-4	Brown SAND with silt	5.3				8.3			SP-SM
A-11	0-2	Brown SAND with silt	6.7				10			SP-SM

GSE Engineering & Consulting, Inc.

SUMMARY REPORT OF LABORATORY TEST RESULTS

Project Number: 16200

Project Name: North Side LS Phase 3

Boring Number	Depth (ft)	Soil Description	pH	Resistivity (ohm-cm)	Chloride Content (ppm)	Sulfate Content (ppm)
A-1	2-6	Loose to medium dense orange very clayey SAND	5.33	55000	BDL	24
A-2	2-6	Very loose to loose pale brown SAND with silt	8.04	22000	BDL	BDL

5.3 Key to Soil Classification

KEY TO SOIL CLASSIFICATION CHART

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests				SYMBOLS		GROUP NAME
				GRAPHIC	LETTER	
COARSE-GRAINED SOILS	Gravels	Clean Gravels	Cu ≥ 4 and 1 ≤ Cc ≤ 3		GW	Well graded GRAVEL
More than 50% retained on No. 200 sieve	More than 50% of coarse fraction retained on No. 4 sieve	Less than 5% fines	Cu < 4 and/or 1 > Cc > 3		GP	Poorly graded GRAVEL
		Gravels with fines	Fines classify as ML or MH		GM	Silty GRAVEL
		More than 12% fines	Fines classify as CL or CH		GC	Clayey GRAVEL
	Sands	Clean Sands	Cu ≥ 6 and 1 ≤ Cc ≤ 3		SW	Well graded SAND
	50% or more of coarse fraction passes No. 4 sieve	Less than 5% fines	Cu < 6 and/or 1 > Cc > 3		SP	Poorly graded SAND
		Sand with fines	Fines classify as ML or MH		SP-SM	SAND with silt
		5% ≤ fines < 12%	Fines classify as CL or CH		SP-SC	SAND with clay
		Sand with fines	Fines classify as ML or MH		SM	Silty SAND
		12% ≤ fines < 30%	Fines classify as CL or CH		SC	Clayey SAND
		Sand with fines	Fines classify as ML or MH		SM	Very silty SAND
		30% fines or more	Fines classify as CL or CH		SC	Very clayey SAND
FINE-GRAINED SOILS	Clays	inorganic	50% ≤ fines < 70%		CL/CH	Sandy CLAY
50% or more passes the No. 200 sieve			70% ≤ fines < 85%		CL/CH	CLAY with sand
			fines ≥ 85%		CL/CH	CLAY
	Silts and Clays	inorganic	PI > 7 and plots on/above "A" line		CL	Lean CLAY
	Liquid Limit less than 50		PI < 4 or plots below "A" line		ML	SILT
		organic	Liquid Limit - oven dried / Liquid Limit - not dried < 0.75		OL	Organic clay / Organic silt
	Silts and Clays	inorganic	PI plots on or above "A" line		CH	Fat CLAY
	Liquid Limit 50 or more		PI plots below "A" line		MH	Elastic SILT
		organic	Liquid Limit - oven dried / Liquid Limit - not dried < 0.75		OH	Organic clay / Organic silt
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor				PT	PEAT

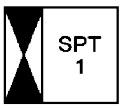
CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

	No. OF BLOWS, N	RELATIVE DENSITY
	0 - 4	Very Loose
	5 - 10	Loose
SANDS:	11 - 30	Medium dense
	31 - 50	Dense
	OVER 50	Very Dense

	No. OF BLOWS, N	RELATIVE DENSITY
	0 - 8	Very Soft
	9 - 18	Soft
LIMESTONE:	19 - 32	Moderately Hard
	33 - 50	Hard
	OVER 50	Very Hard

	No. OF BLOWS, N	CONSISTENCY
	0 - 2	Very Soft
SILTS	3 - 4	Soft
&	5 - 8	Firm
CLAYS:	9 - 15	Stiff
	16 - 30	Very Stiff
	31 - 50	Hard
	OVER 50	Very Hard

SAMPLE GRAPHIC TYPE LEGEND



Location of SPT Sample



Location of Auger Sample

PARTICLE SIZE IDENTIFICATION

BOULDERS:		Greater than 300 mm
COBBLES:		75 mm to 300 mm
GRAVEL:	Coarse -	19.0 mm to 75 mm
	Fine -	4.75 mm to 19.0 mm
SANDS:	Coarse -	2.00 mm to 4.75 mm
	Medium -	0.425 mm to 2.00 mm
	Fine -	0.075 mm to 0.425 mm
SILTS & CLAYS:		Less than 0.075 mm

LABORATORY TEST LEGEND

LL	=	Liquid Limit, %
PL	=	Plastic Limit, %
PI	=	Plasticity Index, %
% PASS - 200	=	Percent Passing the No. 200 Sieve
MC	=	Moisture Content, %
ORG	=	Organic Content, %
k_h	=	Horizontal Hydraulic Conductivity, ft/day

6.0 LIMITATIONS

6.1 Warranty

This report has been prepared for our client for their exclusive use, in accordance with generally accepted soil and foundation engineering practices, and makes no other warranty either expressed or implied as to the professional advice provided in the report.

6.2 SPT Borings

The determination of soil type and conditions was performed from the ground surface to the maximum depth of the borings, only. Any changes in subsurface conditions that occur between or below the borings would not have been detected or reflected in this report.

Soil classifications that were made in the field are based upon identifiable textural changes, color changes, changes in composition or changes in resistance to penetration in the intervals from which the samples were collected. Abrupt changes in soil type, as reflected in boring logs and/or cross sections may not actually occur, but instead, be transitional.

Depth to the water table is based upon observations made during the performance of the SPT borings. This depth is an estimate and does not reflect the annual variations that would be expected in this area due to fluctuations in rainfall and rates of evapotranspiration.

6.3 Site Figures

The measurements used for the preparation of the figures in this report were made using the provided site plans and by estimating distances from existing structures and site features. Figures in this report were not prepared by a licensed land surveyor and should not be interpreted as such.

6.4 Unanticipated Soil Conditions

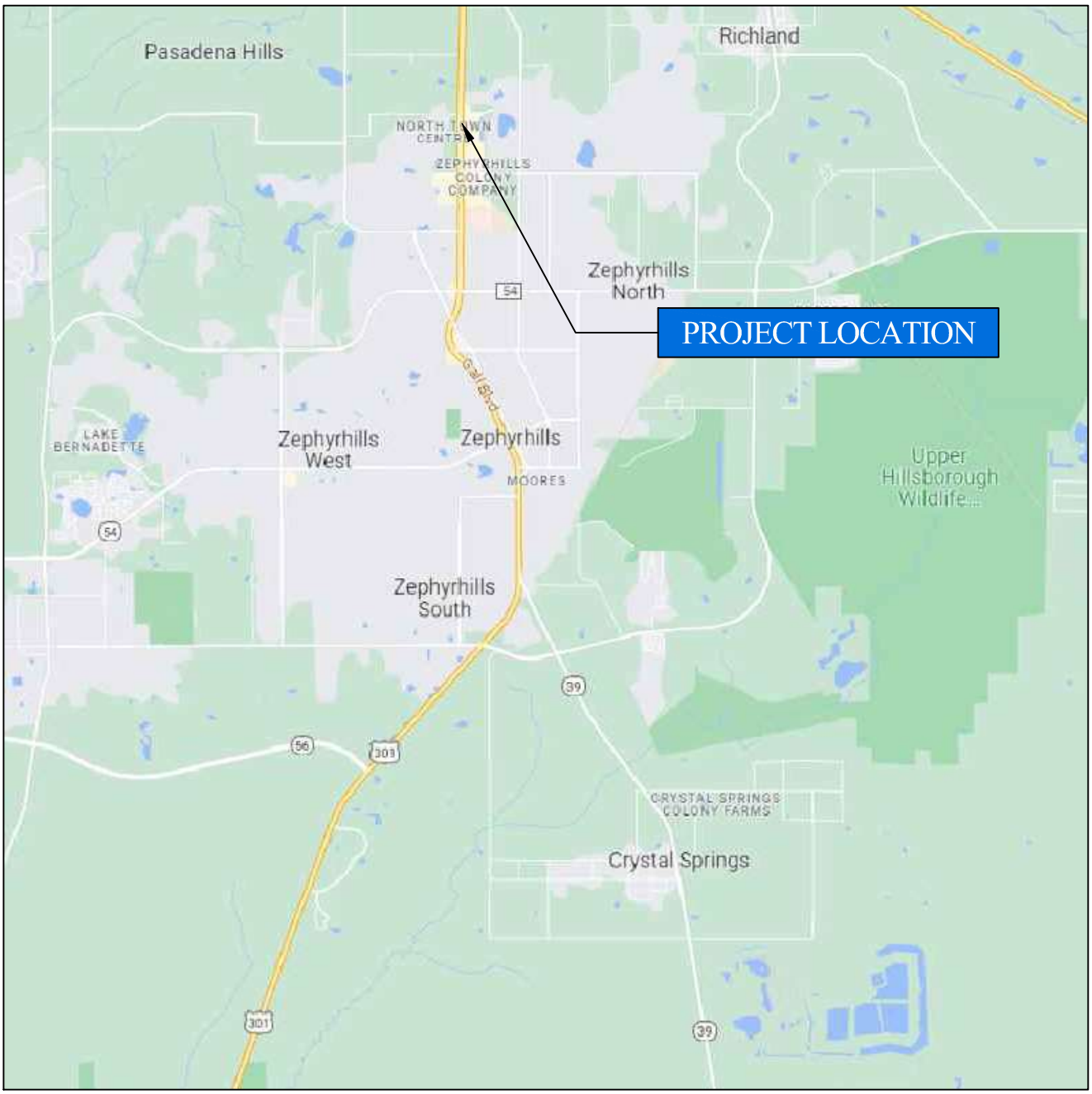
The analysis and recommendations submitted in this report are based upon the data obtained from soil borings performed at the locations indicated on Figure 2. This report does not reflect any variations that may occur between these borings.

The nature and extent of variations between borings may not become known until excavation begins. If variations appear, we may have to re-evaluate our recommendations after performing on-site observations and noting the characteristics of any variations.

6.5 Misinterpretation of Soil Engineering Report

GSE Engineering & Consulting, Inc. is responsible for the conclusions and opinions contained within this report based upon the data relating only to the specific project and location discussed herein. If others make the conclusions or recommendations based upon the data presented, those conclusions or recommendations are not the responsibility of GSE.

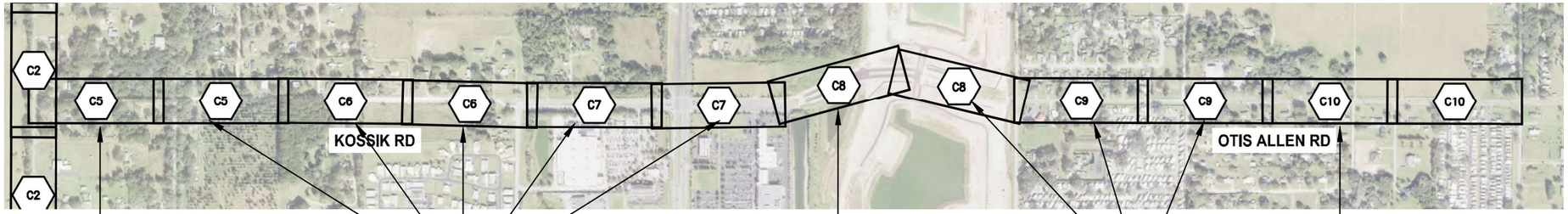
FIGURES



NORTH

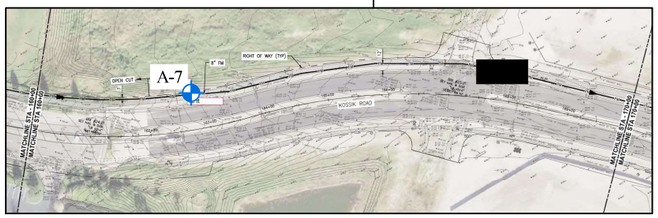
NOT TO SCALE

NORTH SIDE LS PHASE 3 ZEPHYRHILLS, PASCO COUNTY, FLORIDA GSE PROJECT NO. 16200	PROJECT SITE LOCATION MAP		
	DESIGNED BY: KPF CHECKED BY : JEG DRAWN BY : EEW	GSE Engineering & Consulting, Inc.	FIGURE 1





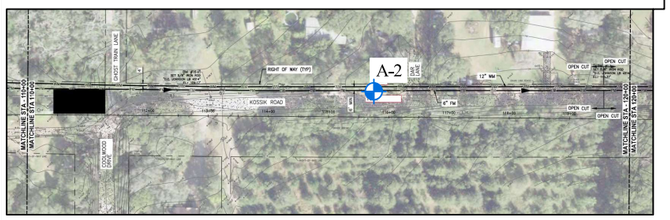
C5



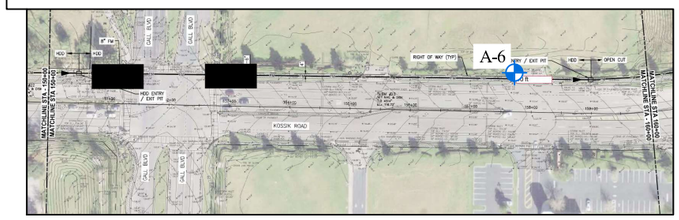
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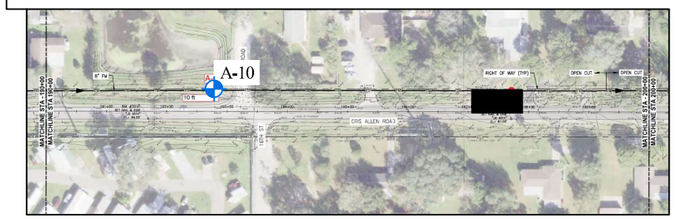
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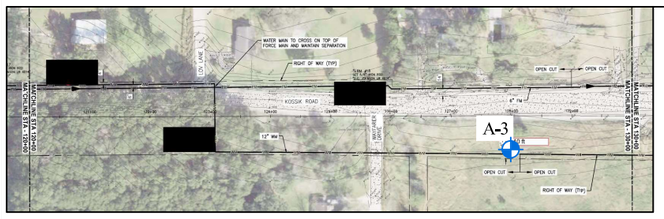
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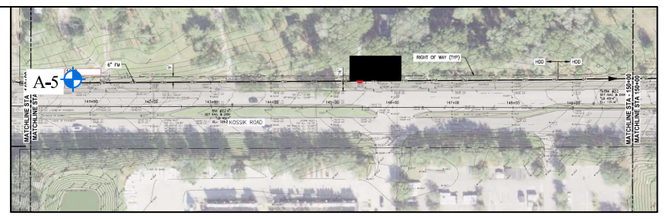
C7



C9



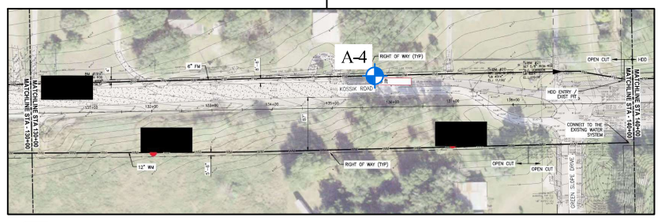
C6



C7



C9



C6



C8

LEGEND:

SPT BORING

0 250'

SCALE: 1" = 250' APPROX.

SITE PLAN SHOWING APPROXIMATE LOCATIONS OF FIELD TESTS

NORTH SIDE LS PHASE 3
ZEPHYRHILLS, PASCO COUNTY, FLORIDA
GSE PROJECT NO. 16200

DESIGNED BY : KPF
CHECKED BY : JEG
DRAWN BY : EEW

GSE Engineering & Consulting, Inc.

FIGURE 2

APPENDIX B

PERMITS

Pasco County
Florida Department of Transportation (FDOT)
Florida Department of Environmental Protection (FDEP) (Water)
Florida Department of Environmental Protection (FDEP) (Wastewater)
Environmental Resource Permit

Pasco County Permit

FDOT Permit

FLORIDA DEPARTMENT OF TRANSPORTATION

UTILITY PERMIT

December 14, 2016

PERMIT NO: 2023-H-798-00203

STATE ROAD INFORMATION

County:	Section:	State Road No:	Beginning Mile Post:	Ending Mile Post:
Pasco	14050000	SR 39	7.847	7.847

APPLICANT INFORMATION

The Utility Agency Owner (UAO) shall be identified in this Applicant Information Box. When the UAO is a City or County and desires to have the Utility Builder make a joint permit applicant, as prescribed in Section 2.1(4) of the 2017 Utility Accommodation Manual (UAM), the Utility Builder shall also be identified in this Applicant Information Box. A Utility Builder alone cannot apply for a utility permit without the City or County adding them as a joint applicant.

Utility Agency/Owner (UAO)

Name: City of Zephyrhills Utilities Department
Contact Person: City of Zephyrhills Utilities Department
Address: 5335 8th St
City: Zephyrhills
State: Florida
Zip: 33542
Telephone: 8137800008
Email: jbostic@ci.zephyrhills.fl.us

Utility Builder (only applicable when the UAO is a City or County)

Name:
Contact Person:
Address:
City:
State:
Zip:
Telephone:
Email:

WORK DESCRIPTION

The Applicant(s) requests permission from the Florida Department of Transportation (FDOT) to construct, operate, and maintain the utilities as described below and as depicted in the incorporated documentation.

The project includes the installation of approximately 12,400 LF of 6" PVC and 5,600 LF of 8" force main and approximately 4,000 LF of 12" PVC potable water main. Project restoration will include; pavement repair, mill and overlay of the roads, re-sodding of affected areas, and replacement of concrete curb/gutter and sidewalk.

Utility Work No:

Additional sheets are attached and are incorporated into this permit Yes ☐ No ☑

For FDEP certification, the FDOT agency report is attached in accordance with UAM Section 2.4.1 (13) Yes ☐ No ☑

TRAFFIC CONTROL (TCP)

☑ The TCP will comply with the following 600 series index(es) 602, 611

☐ A TCP has been attached and incorporated into this permit application in compliance with UAM Section 2.4.2.

MOT Technician's contact information (may be supplied at the two (2) business day notification to FDOT):

Name: _____ Telephone _____ Email: _____

COMMENCEMENT OF WORK

The UAO and/or Utility Builder shall commence actual construction in good faith within sixty (60) calendar days after approval of the permit application. If the beginning date is more than sixty (60) calendar days from the date of approval, the UAO and/or Utility Builder must review the permit with the FDOT Approving Engineer listed to make sure no changes have occurred to the transportation facility that would affect the permit's continued approval. The UAO and/or Utility Builder shall make good faith efforts to expedite the work and complete the work within the calendar days indicated.

Anticipated Start Date: 1/1/2024

Calendar days needed to completed: 365

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

Florida Department of Transportation

UTILITY PERMIT

PERMIT NO: 2023-H-798-00203

APPLICANT SIGNATURE

By the below signature(s) the UAO and/or Utility Builder agree(s) to construct, operate, and maintain the work as noted in the above Work Description, shown in plans and incorporated documents, in compliance with the UAM, all instructions noted in the FDOT Special Instructions Box, and special instructions incorporated into this permit. The UAO and/or Utility Builder declares, the location of all existing utilities that it owns or has an interest in, both aerial and underground, are accurately shown on the plans of the work areas. In accordance with UAM Section 2.8, the UAO and/or Utility Builder further declares that a letter of notification was delivered to the owners of other facilities within the work areas and that those listed below are the only facility owners known to be involved or potentially impacted by the proposed work.

Date Notified:	Name of other facility owners (attach additional sheets if necessary).
6/22/2023	Charter Communications - Duffy McClelland
6/22/2023	City of Zephyrhills - Bruce Sellars
7/6/2023	Duke Energy - Duke Customer Service Center
6/22/2023	Frontier Communications - Toni Cannon
6/22/2023	Zayo Group - Henry Klobucar (ATTEMPTED)

Utility Agency/Owner	Utility Builder (when applicable)
Signature: JOHN BOSTIC III (digital signature) Date: 10/2/2023	Signature: _____ Date: _____
Name (printed): JOHN BOSTIC III	Name (printed): _____
Title: _____	Title: _____

FDOT PROJECT INFORMATION

Pursuant to UAM Section 2.1(10), the utility work is within FDOT projects listed below and must have a Utility Work Schedule for each project approved prior to commencement of work within the FDOT project limits:

FDOT construction is proposed or underway. Refer to Financial Project Id: None.
This work is NOT related to an approved Utility Work Schedule.

FDOT SPECIAL INSTRUCTIONS

In accordance with UAM Section 2.7, FDOT incorporates the below and attached special instructions into this permit.

Contact FDOT James Meyer 48 hours before working in FDOT R/W 352-848-2610, to activate permit.

Provide MOT Technician “Name, Phone Number, Email Address”.

Any Damage to PED Trail to be repaired 10' in each direction of damage, entire

Additional FDOT Special Instructions are attached and incorporated into this permit. Yes ☑ No ☐

PERMIT APPROVAL

By signature below, FDOT gives permission to the UAO and /or Utility Builder to construct, operate, and maintain the utilities indicated in this Utility Permit in compliance with the UAM, all incorporated documents, and special instructions. Any changes to the approved work must be approved by the FDOT’s Approving Engineer and attached and incorporated into this permit in accordance with UAM Section 2.11.

Approving Engineer: James A. Meyer (digital signature) Date: 10/30/2023
Name: James A. Meyer
Title: MAINTENANCE MANAGER/PERMITS

Notification of Utility Work to be provided to: Telephone (352) 848-2600 ext. 2610 or Email: james.meyer@dot.state.fl.us

An FDOT Representative is required to be present on the worksite prior to commencement of work. Yes ☐ No ☑

Rep. Name: _____ Telephone _____ Email: _____

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

Florida Department of Transportation

UTILITY PERMIT

PERMIT NO: 2023-H-798-00203

CERTIFICATION

I, the undersigned UAO and/or Utility Builder, hereby CERTIFY that the utilities were constructed and inspected in compliance with the UAM all incorporated documents, and special instructions. Pursuant to UAM Section 2.11, all changes have been approved by the FDOT's Approving Engineer and incorporated into this permit along with all other material certifications, test results, bore logs, approved plans changes, as-built plans or other required documentation.

I also CERTIFY that work began on _____ and was completed on _____ and that the area was left in as good or better condition than when the work began.

Utility Agency/Owner	Utility Builder (when applicable)
Signature: _____ Date _____	Signature:_____ Date _____
Name (printed): _____	Name (printed): _____
Title: _____	Title: _____

FINAL INSPECTION OF WORK

☐ The work was inspected and found to be in non-compliance as noted below:

☐ All issues of non-compliance listed above have been brought into compliance and/or FDOT has no outstanding issues that need to be addressed by the UAO and/or Utility Builder. However, this final inspection does not release the UAO and/or Utility Builder of their continuing responsibilities pursuant to Rule 14-46.001, the UAM, all incorporated documents, and special instructions.

FDOT Inspector: _____ Date: _____

Name: _____

Title: _____

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

PERMIT NO.: 2023-H-798-00203

STATE ROAD INFORMATION:

NAME OF OTHER FACILITY OWNERS / DATE NOTIFIED:

Facility Name: Pasco County Traffic Operations Div. Venkat Vattikuti, Date Notified: 6/22/2023, Facility Name: Pasco County Utilities - George Demint, Date Notified: 6/22/2023, Facility Name: Teco - Joan Domnin, Date Notified: 6/22/2023

FDOT PROJECT INFORMATION:

FDOT construction is proposed or underway. Refer to Financial Project Id: None.
This work is NOT related to an approved Utility Work Schedule.

THE WORK WAS INSPECTED AND FOUND TO BE IN NON-COMPLIANCE AS NOTED BELOW:

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

PERMIT NO.: 2023-H-798-00203

The complete special instructions could not fit in the space allotted on Page 2 of the Utility Permit so they are displayed below.

Special FDOT Instructions

Contact FDOT James Meyer 48 hours before working in FDOT R/W 352-848-2610, to activate permit.

Provide MOT Technician “Name, Phone Number, Email Address”.

Any Damage to PED Trail to be repaired 10' in each direction of damage, entire width of the trail. Match existing.

FDOT R/W to be restored with sod only.

Sidewalks or PED Trail shall NOT be closed more than 2 weeks the duration of the permit. The contractor will need to provide accommodation for pedestrians.

Contact Scott Brown Pasco County for locates of lighting fiber and signal conduits Pasco County
727-849-6845

Full set of plans added just for reference. Sheets C-7 and C-10 are FDOT R/W work.

Enter in the FDOT’s One Stop Permitting – “Certify Construction Complete” or provide, original signed copy of Permit Application (pg. 3 of 3) and As-builts. Once construction is completed for permit close out.

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

143+00 144+00 145+00 146+00 147+00 148+00

BM #22
SET NAIL & DISK
"LD 451.4"
EL.: 129.2

KOSSIK ROAD

STORM INLET
TOP EL.: 126.85'
24" RCP(W) I.E.: 120.22'
24" RCP(E) I.E.: 120.11'
18" RCP(N) I.E.: 120.22'

STORM INLET
TOP EL.: 131.79'
24" RCP(W) I.E.: 120.60'
18" RCP(N) I.E.: 121.00'
18" RCP(E) I.E.: 120.67'

SURVEY No.1

EDGE OF PAVEMENT
BACK OF CURB
TOP OF BANK
TOE OF SLOPE
RIGHT-OF-WAY LINE
SIDEWALK
ACCESS ROAD
CHAIN LINK FENCE
WM
FM

R = 38,197.19'
P.C. STA. 451+58.03 (451+51.80)
P.T. STA. 470+76.98 (470+74.00)

G 8" FORCE MAIN
ZEPHYRHILLS

GALL BLVD

ASPHALT 10' IN EACH
N OF THE DAMAGE, ENTIRE
F THE TRAIL. MATCH EXISTING.

1-8" DI MJ SLEEVE
CONNECT TO EXISTING CAPPED
8"PLUG VALVE AND TEE

OPEN CUT

REMOVE & REPLACE
(±647 SY)
CONCRETE SIDEWALK

RIGHT OF WAY (TYP)

485 LF 8" FM-1

5' (TYP)

9' (TYP)

SANITARY MANHOLE
TOP EL.: 116.09'

STORM INLET
TOP EL.: 118.16'
30" RCP(S) I.E.: 112.27'
24" RCP(N) I.E.: 112.19'

STORM INLET
TOP EL.: 114.46'
18" RCP(N) I.E.: 110.57'
18" RCP(S) I.E.: 110.49'

STORM INLET
TOP EL.: 114.10'
18" RCP(S) I.E.: 110.82'

STORM INLET
TOP EL.: 112.26'
18" RCP(S) I.E.: 108.01'

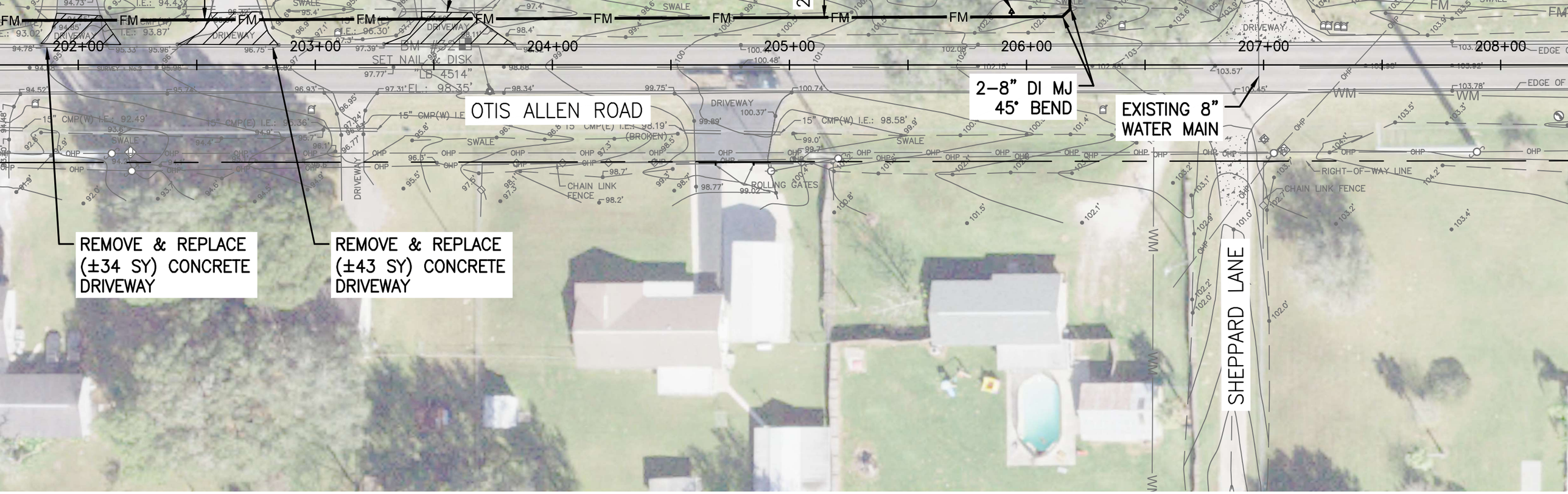
ADA WARNING PADS
CONCRETE MEDIAN

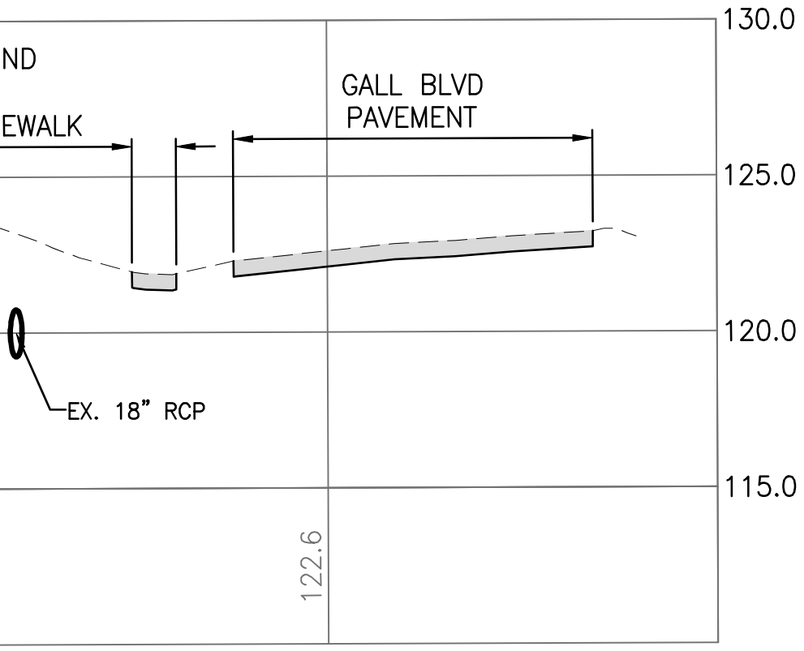
SET NAIL & DISK
"LB 4514"
EL.: 116.72'

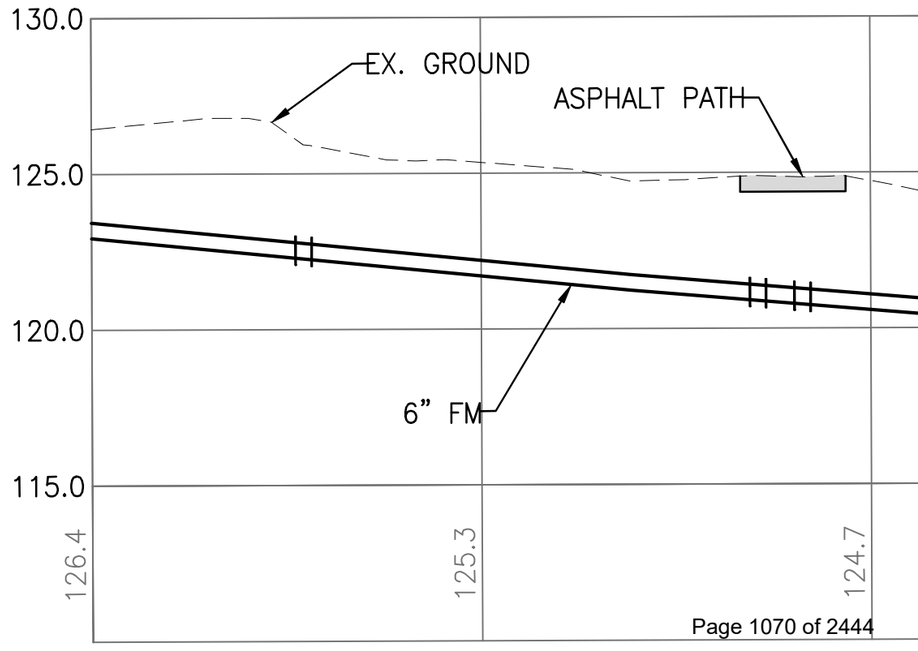
253+00 254+00 255+00 256+00 257+00 258+00 259+00

153+00 154+00 155+00 156+00 157+00 158+00

KOSSIK ROAD


202+00
203+00
204+00
205+00
206+00
207+00
208+00
OTIS ALLEN ROAD
SHEPPARD LANE
REMOVE & REPLACE (±34 SY) CONCRETE DRIVEWAY
REMOVE & REPLACE (±43 SY) CONCRETE DRIVEWAY
2-8" DI MJ 45° BEND
EXISTING 8" WATER MAIN
SET NAIL & DISK "LB 4514"
BM #52
FL.: 98.35'
15" CMP(W) I.E.: 92.49'
15" CMP(E) I.E.: 93.36'
15" CMP(W) I.E.: 96.30'
15" CMP(E) I.E.: 96.19' (BROKEN)
15" CMP(W) I.E.: 98.58'
CHAIN LINK FENCE
ROLLING GATES
RIGHT-OF-WAY LINE
EDGE OF
SWALE
DRIVEWAY
OHP
WM
FM


ND
EWALK
GALL BLVD
PAVEMENT
EX. 18" RCP
130.0
125.0
120.0
115.0
122.6


EX. GROUND
ASPHALT PATH
6" FM
130.0
125.0
120.0
115.0
126.4
125.3
124.7

SEE THE PERMIT - PART 2: Engineer responsible for inspection, PART 3: Completion date, PART 4: General Provisions, PART 5: Special Provisions.

SPECIAL PROVISIONS

This Permit subject to the following provisions, conditions and stipulations: This Permit issuances DOES NOT in any way approve the applicant's plan.

1. **Notification:** Contact the Florida Department of Transportation (FDOT) 48 hours before starting construction. (A pre-construction meeting and **liability insurance is required for all permits –see Permit Category, Permit page 1, part 1 Permit Information).**

   Contact: James Meyer, Permits Manager OR David Skrelunas Brooksville Operations Program Engineer
   16411 Spring Hill Dr. Brooksville, FL.34604 * 352- 848-2600 Monday -Thursday 7:00 A.M. to 5:30 P.M.

2. **Work and Material Standards -Specifications:** ***The FDOT standards, specifications and Permit take priority over the permittee's plans.*** All construction work and materials must (mandatory) be FDOT certified and in conformance with the latest edition of the FDOT *Standard Plans for Road and Bridge Construction (Standard Plans), Utility Accommodation Manual, Standard Specifications (Spec.s), Florida Design Manual* and *Flexible Pavement Design Manual for New Construction and Pavement Rehabilitation*.

3. **Maintenance of Traffic:** All Maintenance of Traffic (TTC) signs and markings (including for bicycles, sidewalks and pedestrians), for lane/road closures, detours and right of way work for construction and/or maintenance must be in conformance with the *Standard Plans 102 - 600 series (use appropriate SP for the work type - multi or two lanes, urban or rural roadways).* All work only during daytime unless otherwise approved, and off-peak work hours may be required. All night work or overnight MOT must be approved by the FDOT. Submit lane closure calculations as required. All MOT must be set up and maintained by a certified MOT work site safety supervisor.

4. **Driveway/Connection Design:** The driveway must be in conformance with the *Standard Plans 000-515* (Rural or Urban) including the radius, slopes and remove/replace the paved shoulder in front of the driveway (see Pavement Structure) to a matching roadway structural section. The driveway profile grade maximum is 10% for commercial and 28% for residential. Urban flared driveway with sidewalk must have the correct walkaround, flares, slopes, ramps and detectable warnings. See *Standard Plans 522-001, 522-002 and 000-515 sheets 2,3,4 of 7.*

5. **Roadway Widening Design:** All rural or urban roadway widening for more lanes in conjunction with a driveway must match existing roadway and slope (usually 2-3%) with a 11 feet wide outside paved shoulder (usually 5 feet wide with 6% slope paved and 6 feet wide 6% slope unpaved shoulder, left turn lane shoulders match existing median shoulders). The shoulder front ditch slope is usually 1 (rise) to 6 (run). Maintain clear recovery zone distances and if required use guardrails and handrails for excessive slopes and obstructions. The widening approach solid/skip striping pattern must be in conformance with *Standard Plan 711-001, sheet 5-14.*

6. **Drainage - Mitered End Sections:** All project drainage should be away from the FDOT roadway and right-of-way. The connection must drain away from the roadway for at least 5 feet. A Drainage Permit or exemption is required for any drainage work within or discharge to the FDOT right of way. The driveway and mitered end section *(Standard Plan 430-022)* including (correctly sized with beveled/radii corners and splash pads), pipe size and type, shoulder width and 1v:4h side slopes must be in conformance with *Standard Plan 430-022, 430-001 and 000-515.* All other drainage work and materials must be in conformance with F.D.M. and *Standard Plan 425-001 to 524-001*.

7. **Construction Stages –Time Period:** The permittee's engineer is responsible for inspection. All construction must be done in stages with each stage (for example) subgrade, base, etc. inspected and approved by the FDOT (or the inspection must be waived by the FDOT) before starting the next stage. Complete the construction in a timely manner and within one year of issuance as noted on the permit.

8. **Turn Lanes - Sight Distance:** The median opening and spacing, left turn lane transitions, queues and lengths must be in conformance with FDM. The sight distance and length must be in conformance with FDM.

9. **Signs and Striping:** All traffic signs, striping, raised pavement markers and pavement markings must be in conformance with FDOT Standard *Plan 11000 and 17000 series*. See *Standard Plan* for pavement markings, thermoplastic and traffic signs. Apply thermoplastic 14 days (no wait for concrete) after paving and apply interim striping until thermoplastic is applied. Remove existing striping by mill and resurface with matching asphalt (water blasting and grinding are not allowed). A rural commercial driveway must have at a minimum a high intensity reflective 36" R1-1 STOP sign with a 24" wide stop bar located between 12-25 feet away from the roadway.

10. **Sod and Erosion Control**: All areas in the right of way disturbed during construction must be restored, compacted, sodded and watered in conformance with the *Standard Specifications, Section 104* and *Standard Plan 570-001, 570-010.* Excess shoulder lime rock must be removed or mixed with a sufficient amount of soil and fertilizer to ensure growth. During construction install erosion control, silt fences, turbidity barriers etc. in conformance with *Standard Specifications, Section 104*, NPDES/DEP and SWPPP (Stormwater permit/plan) requirements.

11. **Pavement:** The mainline widening etc. (and the mainline shoulder in front of the connection must be removed and replaced), MUST match the mainline thickness, type of stabilization, base and structural course, friction course (FC), and aggregates etc. (course or fine graded), unless otherwise directed by the FDOT/engineer. Submit approved testing laboratory certification for the design mix and density test results. The density tests must be a minimum of 3 per section of widening for each lift, unless otherwise directed by the FDOT/engineer. The paving seam lines must align with striping, and if needed use compatible mill and overlay, resurface, leveling etc., over entire existing roadway to reduce old/new pavement joints. **Driveway Pavement:** The minimum driveway pavement section: (this driveway pavement is not for the mainline and does not replace a better or match existing pavement or as specified by the FDOT/engineer. For roadway widening see Pavement Design Manual design criteria; traffic volumes, rural/urban, multi/single lanes, loads, soil, speed etc.):

    A. Sub-base: Stabilized 12 inch below the base* or ***Skip to Option A-1***
    Base: 8-inch-thick primed lime rock (double course – 4-inch lifts) or B-12.5 (Superpave asphalt base) if required
    Surface: 1.5-inch-thick asphalt type SP or type S (and **FC shoulder as needed) (and/or match existing structural & FC)

    A-1. Sub-base: No sub grade is required
    Base: 12-inch-thick primed lime rock (6-inch lifts) * or B-12.5 (Superpave asphalt) if required (1.5 x 8" = 12" base)
    Surface: 1.5-inch-thick asphalt surface type SP or type S and **FC as needed (and/or match existing structural & FC)

    or B. Sub-base: No compaction specified*
    Base: 8-inch-thick Sand Asphalt Hot Mix (triple course – 3 lifts) 800 lb. stability
    Surface: 1.5-inch-thick asphalt type SP or type S and **FC as needed

    or C. 6-inch-thick of FDOT approved Class I 3000 psi concrete (6" for traffic bearing & 4" for sidewalk) on suitable soil with expansion joints as required. See *Standard Specifications 346 and 350*

    * The sub-base (stabilization) must extend 4 inches beyond the base above and/or the base must extend 4 inches beyond the pavement section above (or 4 inches beyond back of curb)
    **The FC may not be required on low volume/speed driveways beyond the mainline shoulder, providing the mainline and driveway surface difference ("lip") does not exceed the limit.

12. **Lime rock Base:** The lime rock base material must be from a FDOT approved source. At no time must a lift course thickness exceed 6 inches. The lime rock base must be in conformance with FDOT *Design Standards 514* and *Standard Specifications, Section 200.* The Type B-12.5 asphalt black base may be required by the FDOT to expedite work or for wet conditions etc.

13. **Site/Other Approvals/Permits**: The permittee must comply with all federal, state, county and local ordinances with proof of local site plan approval, Southwest Florida Water Management District and Turnpike District permits/approval, utility company notifications/locates and coordination with other FDOT projects etc. This connection must not be of any cost to the FDOT or interfere with other FDOT projects.

14. **Easements/Dedications:** The permittee/engineer must ensure that all easements and dedications are recorded and submitted to FDOT before final acceptance of the permit.

15. **Quality Control and Acceptance:** The permittee and/or permittee's engineer is/are responsible for inspecting the work and material's and meet all FDOT indices, standards, specifications, conditions, qualified/approved/certified products and provisions of the permit. Submit a *Record Drawings Report by Permittee's Professional Engineer* (FDOT form 850-040-19) and AS BUILTS (if needed). The permit issuance

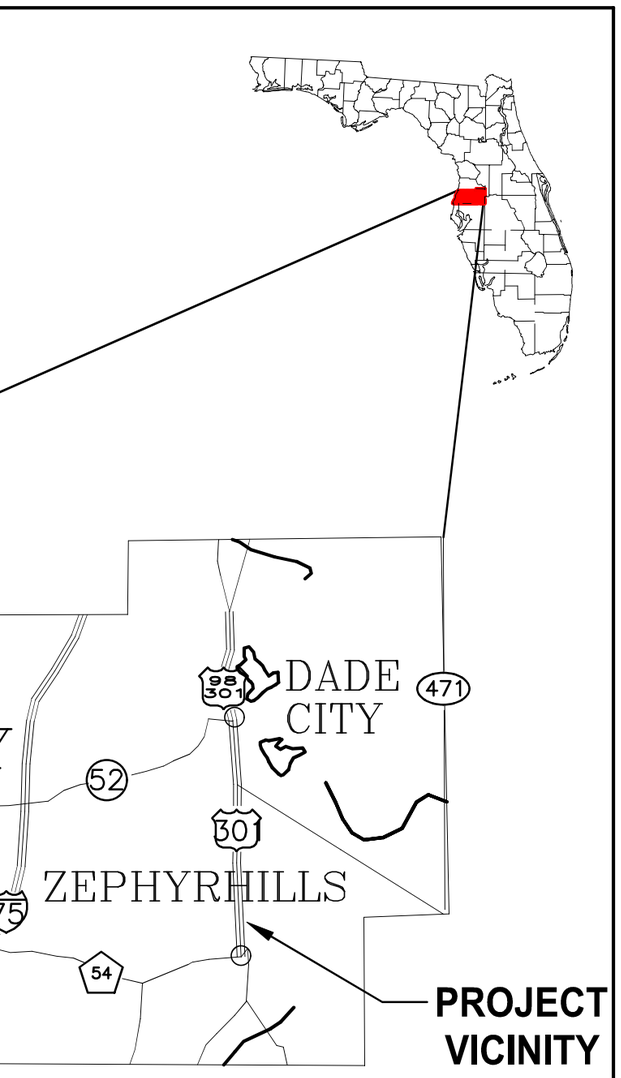
Authorized
Date: 08/08/2023
James A. Meyer
FDOT

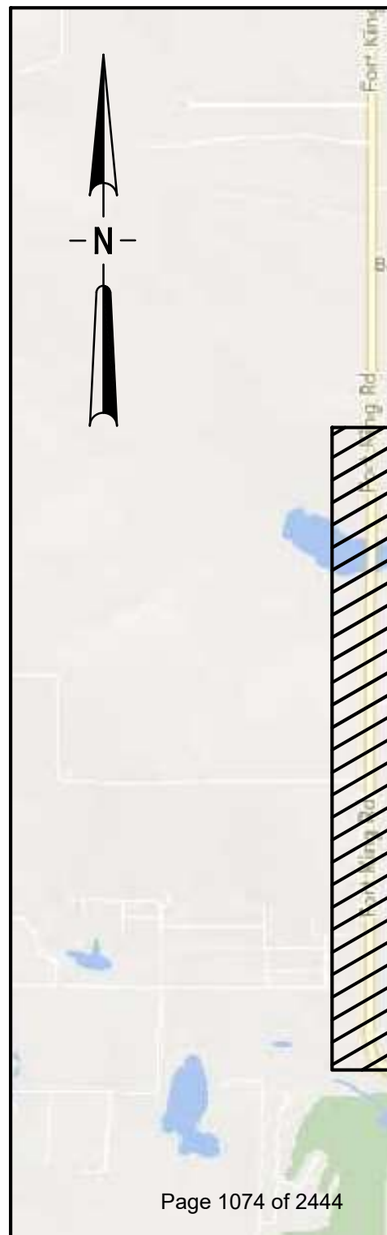
Approved
2023-H-798-00203
James A. Meyer
10/30/2023

does not relieve the permittee, contractor and engineer from complying with FDOT requirements. The FDOT must accept the driveway BEFORE the driveway may be used. G:\PermitACCESS\Brooksville Forms\Permit Attachments - FDOT Attach this for permit issueance\PERMIT ATTACHMENT Special Provisions.doc

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

PREPARED FOR:





PREPARED BY:

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING POWER/TELEPHONE COMPANIES AND ARRANGING TO HAVE UTILITIES POLES HELD AND/OR GUY WIRES REMOVED AND REPLACED, IF NECESSARY FOR CONSTRUCTION, AT NO ADDITIONAL COST TO THE OWNER.

SAFETY

17. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE FAMILIAR WITH THE OSHA EXCAVATION SAFETY STANDARDS AND TO ABIDE BY THEM AS COVERED UNDER THE FLORIDA TRENCH SAFETY ACT.

18. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION SAFETY.

RESTORATION

19. ALL PAVING, STABILIZED EARTH, DRIVEWAYS, CURBS, SIDEWALKS, FENCES, SOD, LANDSCAPING, CULVERTS, ETC. DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE RESTORED BY AND AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.

ACCESS/MAINTENANCE OF FACILITIES

20. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL EXISTING UTILITIES/FACILITIES AND MAINTAIN UNINTERRUPTED SERVICES THROUGHOUT THE CONTRACT PERIOD.

PIPING NOTES

21. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS. CONTRACTOR SHALL TAKE CARE TO PROVIDE PROPER GRADE ELEVATIONS AND ALIGNMENTS.

22. SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE. TYPE OF JOINT AND FITTING MATERIAL SHALL BE AS SPECIFIED FOR THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE.

23. CONTRACTOR SHALL CONSTRUCT NEW BELOW GRADE PIPING WITH A MINIMUM COVER OF 36". IF A MINIMUM COVER OF 36" CANNOT BE ACHIEVED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING.

24. CONTRACTOR SHALL INSTALL MINIMUM OF 1/4" THICK NEOPRENE PADDING BETWEEN PIPE AND SUPPORTS FOR DUCTILE IRON PIPE AND PIPE WITH COATINGS.

UTILITY SEPARATION

25. EACH PROPOSED UTILITY SHALL BE LAID TO ACHIEVE THE MINIMUM HORIZONTAL SEPARATION BETWEEN IT AND OTHER UTILITIES IN ACCORDANCE WITH THE TYPICAL UTILITY HORIZONTAL SEPARATION DETAIL AND FDEP REQUIREMENTS.

26. AT LOCATIONS WHERE A PROPOSED UTILITY CROSSES ANOTHER UTILITY, THE PROPOSED UTILITY SHALL BE INSTALLED IN ACCORDANCE WITH THE TYPICAL UTILITY CONFLICT DETAIL AND FDEP REQUIREMENTS.

REQUIRED.

33. PLEASE NOTE EXISTING UTILITIES AS SHOWN IN THE DRAWINGS ARE GIS DATA. CONTRACTOR SHALL VERIFY EXISTING UTILITIES LOCATIONS CONSTRUCTION.

SPECIAL REQUIREMENTS TO HAND-DIG EXCAVATIONS EXISTING UTILITY COORDINATION

34. PLEASE NOTE AREAS OF EXISTING UTILITIES IN CLOSE PROXIMITY TO THE INSTALLATION HAVE BEEN NOTED WITH DASHED RECTANGULAR BOXES SHO PLANS.

35. IN THE NOTED AREAS AND OTHER AREAS IDENTIFIED DURING CONSTRUCTIO CONTRACTOR SHALL HAND DIG ALL EXCAVATIONS WITHIN 10 FEET IN ALL OF A MARKED LOCATED UTILITY LINE.

36. THE CONTRACTOR SHALL ALSO HAND DIG A PILOT TRENCH WHEN CALLED DIG PERMIT FOR ALL UNDERGROUND UTILITY WORK ALONG THE CENTERLIN TRENCHES AND DOWN TO THE BOTTOM ELEVATION OF THE NEW UTILITY.

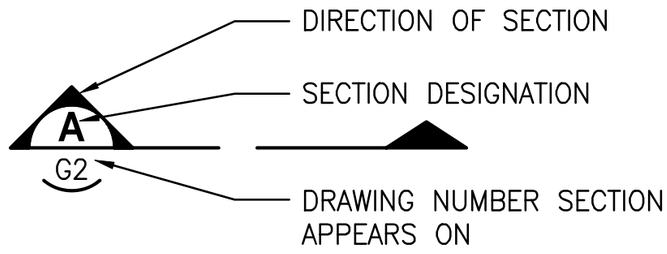
37. MACHINE EXCAVATION SHALL PROCEED ONLY AFTER IT IS DETERMINED THA EXISTING UTILITIES HAVE BEEN IDENTIFIED AND PROTECTED.

HORIZONTAL DIRECTIONAL DRILL NOTES

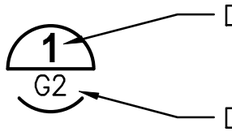
38. BORING LAYOUT BASED ON MINIMUM RADIUS OF 400 FEET. MAXIMUM BAC DIAMETERS SHALL BE
    13.6–INCH FOR 8–INCH DR–11 HDPE PIPE
    10.4–INCH FOR 6–INCH DR–11 HDPE PIPE

39. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNERS FOR ACCESS D INSTALLATION.

40. BORE DEPTH ON BORES BENEATH FDOT ROADWAY PAVEMENT SHALL BE 1 REAMER SIZE PER UAM 3.16.9.1.



SECTION DESIGNATION



DETAIL

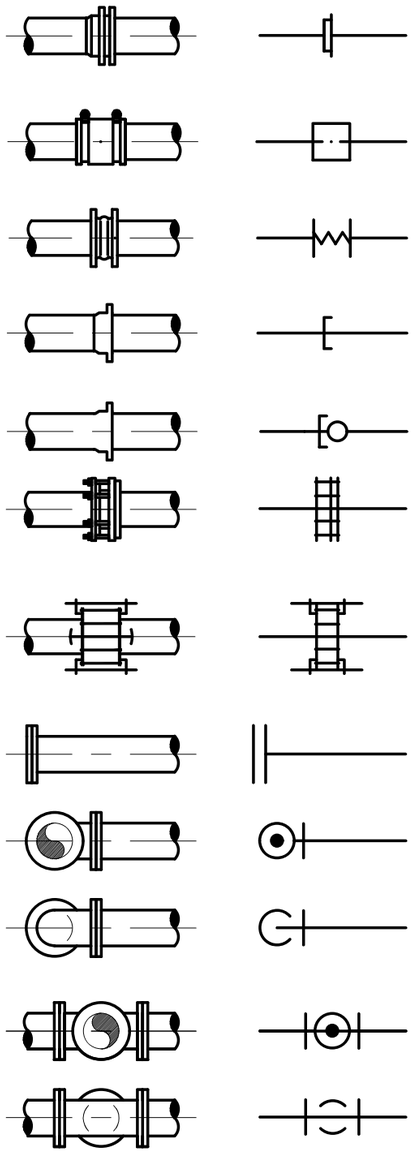
CT CURRENT
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FACE, EXHAUST FAN
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PTICAL REINFORCED CONCRETE PIPE
ATED STORAGE TANK
TERA
WAY
TING
IDA BUILDING CODE
HED FLOOR
ICATED
IDA ADMINISTRATIVE CODE
GED COUPLING ADAPTER
CONTROL VALVE
IDA DEPARTMENT OF ENVIRONMENTAL
TECTION
NDATION
IDA DEPARTMENT OF TRANSPORTATION
ER
ELEMENT
HED FLOOR
HED FLOOR ELEVATION
HED GRADE, FIBERGLASS
HYDRANT
RE
HED
INDICATING TRANSMITTER
GED JOINT
R

HA	HAND AUGER
HD	HAND
HDD	HORIZONTAL DIRECTIONAL DRILL
HDNS	HARDNESS
HDPE	HIGH DENSITY POLYETHYLENE
HHWL	HIGH HIGH WATER LEVEL
HK	HOOK
HOA	HAND–OFF–AUTO
HOR	HAND–OFF–REMOTE
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HR	HANDRAIL
HSP	HIGH SERVICE PUMP
HT	HEIGHT
HWL	HIGH WATER LEVEL
I&C	INSTRUMENTATION AND CONTROL
IC	INTERRUPTING CAPACITY
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
IF	INSULATED FLANGE
IJ	ISOLATION JOINT
INC	INCORPORATED
IPS	IRON PIPE SIZE
J, JB	JUNCTION BOX
JT	JOINT
KA	KILOAMPERES
KB	KNEE BRACE
KCMIL	THOUSAND CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT AMPERES
KW	KILOWATTS
KWH	KILOWATT HOUR
L	LOWER
LB, LBS	POUND(S)
LE	LEVEL ELEMENT
LEL	LOWER EXPLOSIVE LIMIT
LF	LINEAR FEET
LG	LONG
LIT	LEVEL INDICATING TRANSMITTER
LIU	LIGHT INTERFACE UNIT
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LLWL	LOW LOW WATER LEVEL
LOS	LOCKOUT STOP
LR	LONG RADIUS, LOCAL–REMOTE
LS	LIFT STATION
LSIG	LONG SHORT INSTANTANEOUS GROUND
LWL	LOW WATER LEVEL
M	MAGNETIC CONTACTOR COIL, MOTOR,

NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NPT	NATIONAL PIPE THREAD
NPW	NON POTABLE WATER
NRS	NONRISING STEM
NS	NEAR SIDE
NSF	NATIONAL SANITATION FOUNDATION
NTS	NOT TO SCALE
NW	NORTH WEST
OC	ON CENTER(S), OPEN–CLOSE(D)
OCA	OPEN–CLOSE–AUTO
OCR	OPEN–CLOSE–REMOTE
OD	OUTSIDE DIAMETER
OF	OVERFLOW
OO	ON–OFF
OOA	ON–OFF–AUTO
OOR	ON–OFF–REMOTE
OPP	OPPOSITE
ORP	OXIDATION REDUCTION POTENTIAL
OS&Y	OUTSIDE STEM AND YOKE
OSC	OPEN–STOP–CLOSE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
P&ID	PIPING AND INSTRUMENTATION DIAGRAM
P/L	PROPERTY LINE
PB	PULL BOX
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PCV	PRESSURE CONTROL VALVE
PE	PLAIN END, POLYETHYLENE
PET	POLYETHYLENE TUBING
PF	POWER FACTOR
pH	HYDROGEN ION CONCENTRATION
PH	PHASE
PI	POINT OF INTERSECTION/PLANT INFLUENT
PID	PROPORTIONAL INTEGRAL DERIVATIVE
PIT	PRESSURE INDICATING TRANSMITTER
PIV	POST INDICATOR VALVE
PL	PLATE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PLCS	PLACES
POC	POINT OF CONNECTION
POE	POINT OF ENTRY
POJ	PUSH ON JOINT
PP	POWER POLE

RT	RIGHT
RTU	REMOTE TELEMETRY UN
SARV	SURGE ANTICIPATOR RE
SBC	STANDARD BUILDING CO
SCH	SCHEDULE
SCJ	SAW CUT JOINT
SDI	STEEL DECK INSTITUTE
SE	SOUTH EAST
SEC	SECOND
SF	SLOWER–FASTER
SHEC	SHOULDERED–END COU
SHT	SHEET
SIM	SIMILAR
SJI	STEEL JOINT INSTITUTE
SM	STATIC MIXER
SP	SPACING, SPACED
SPD	SURGE PROTECTIVE DEV
SQ	SQUARE
SR	STATE ROAD, SURGE RE
SRV	SURGE RELIEF VALVE
SS	START–STOP
SS, SST	STAINLESS STEEL
SSC	SUPERVISORY SET POIN
SSRV	SOLID STATE REDUCED
ST	SHUNT TRIP
STA	STATION
STD	STANDARD
STL	STEEL
STS	STORMWATER SEWER
SW	SOUTH WEST, SWITCH
SWD	SIDE WATER DEPTH
SWJ	SOLVENT WELD JOINT
SWPPP	STORM WATER POLLUTIO
SY	SQUARE YARD
T, THK	THICK
T/	TOP OF
T/B,T&B	TOP AND BOTTOM
TBM	TEMPORARY BENCHMARK
TEMP	TEMPERATURE
TGS	THREADED GALVANIZED
TGSP	THREADED GALVANIZED
TH	TOTAL HEAD
THERMO	THERMOSTATIC
THD	THREADED
TJB	TERMINAL JUNCTION BO
TK	TANK
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TOSJ	TOP OF STEEL JOIST
TOW	TOP OF WALL
TS	TUBULAR STEEL



MECHANICAL JOINT OR RESTRAINED PUSH–ON JOINT

FLEXIBLE COUPLING ADAPTER

EXPANSION JOINT

HUB & SPIGOT JOINT

BALL JOINT

FLANGED COUPLING ADAPTER W/ THRUST TIES

FLEXIBLE COUPLING WITH THRUST TIES

BLIND FLANGE

ELBOW UP

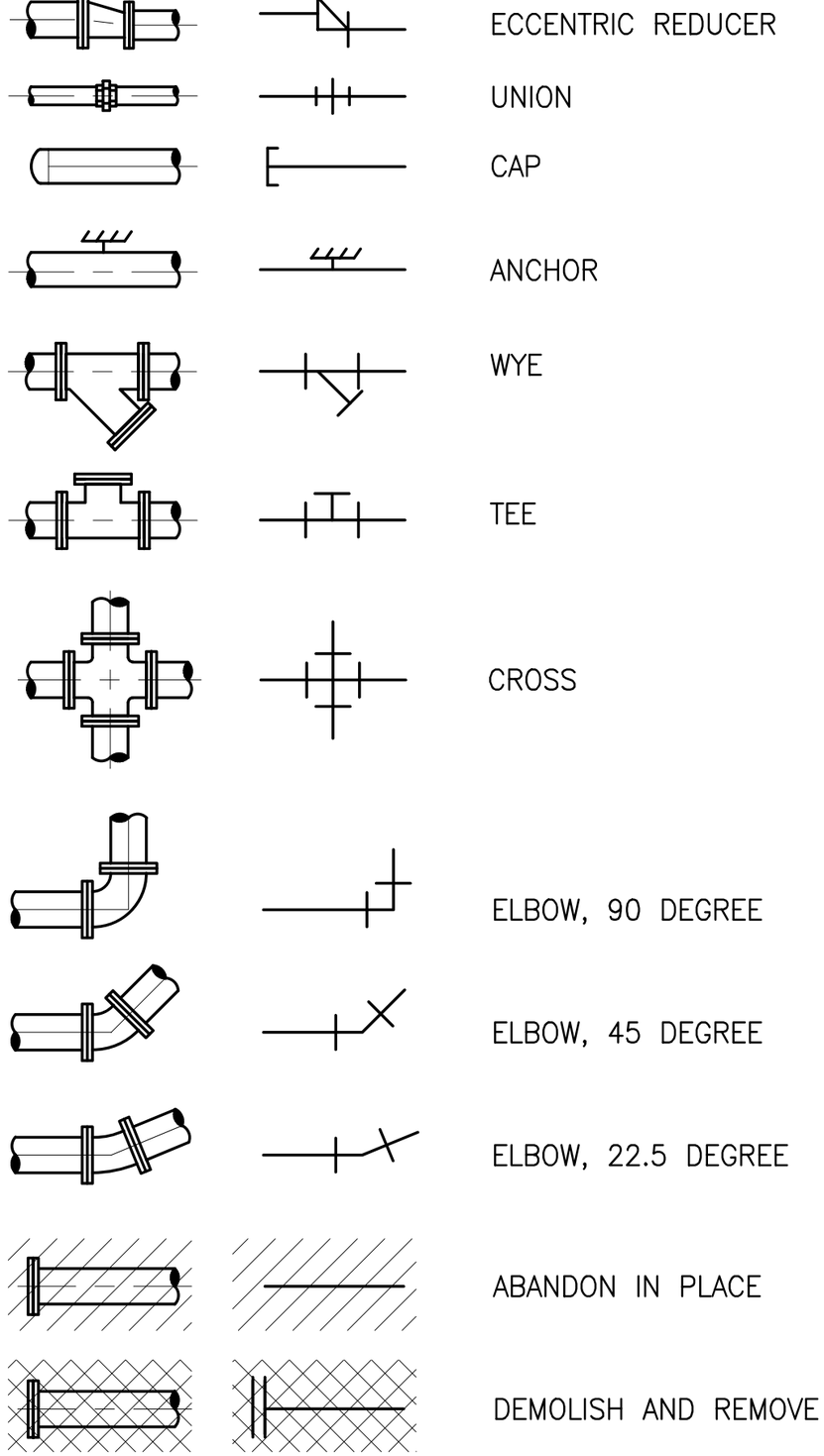
ELBOW DOWN

TEE UP

TEE DOWN

FEMALE QUICK DISCONNECT FITTING

MALE QUICK DISCONNECT FITTING



ECCENTRIC REDUCER

UNION

CAP

ANCHOR

WYE

TEE

CROSS

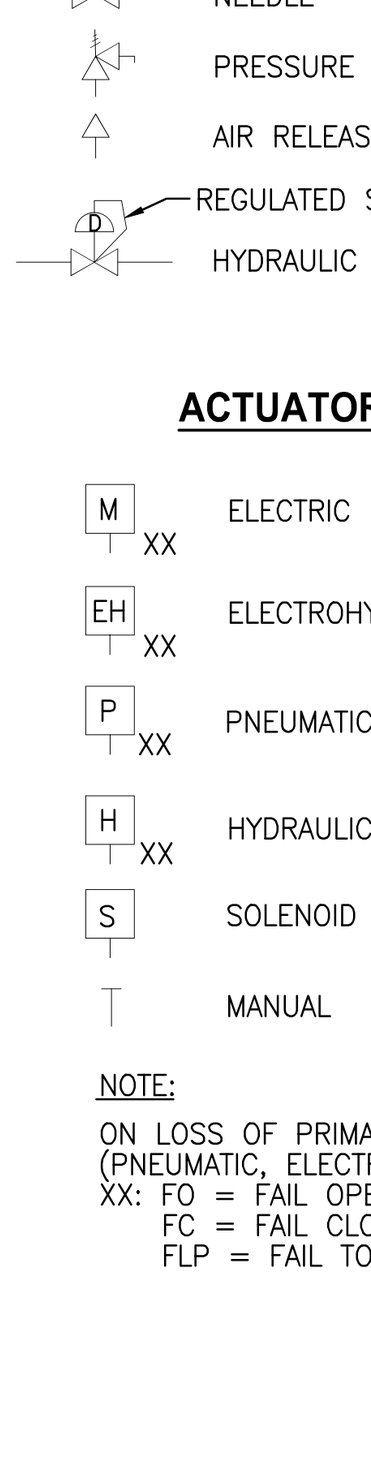
ELBOW, 90 DEGREE

ELBOW, 45 DEGREE

ELBOW, 22.5 DEGREE

ABANDON IN PLACE

DEMOLISH AND REMOVE



PRESSURE

AIR RELEAS

REGULATED

HYDRAULIC

ACTUATOR

M XX ELECTRIC

EH XX ELECTROHY

P XX PNEUMATIC

H XX HYDRAULIC

S SOLENOID

MANUAL

NOTE:

ON LOSS OF PRIMA
(PNEUMATIC, ELECTR
XX: FO = FAIL OPE
FC = FAIL CLO
FLP = FAIL TO

PIPE SCHEDULE

HALL BE CONSTRUED TO GIVE ANY RIGHTS OR
TO ANYONE OTHER THAN THOSE CERTIFIED TO. THIS
EETS THE "STANDARDS OF PRACTICE" SET FORTH BY
DA BOARD OF LAND SURVEYORS IN CHAPTER 5J-17
DMINISTRATIVE CODE.

VEY WAS PREPARED WITHOUT AN ABSTRACT OF TITLE;
E THE UNDERSIGNED MAKES NO GUARANTEES OR
TATIONS REGARDING INFORMATION SHOWN HEREON
G TO EASEMENTS, RIGHTS-OF-WAY, SETBACK LINES,
TS, RESERVATIONS, OR OTHER SIMILAR MATTERS.

UMENTS OF RECORD REFLECTING EASEMENTS,
-WAYS AND/OR OWNERSHIP WERE FURNISHED TO
RSIGNED EXCEPT AS SHOWN.

RGROUND INSTALLATIONS, IMPROVEMENTS OR
MENTS, HAVE BEEN LOCATED EXCEPT THOSE SHOWN

S SHOWN HEREON ARE BASED UPON NORTH
VERTICAL DATUM OF 1988 (NAVD88), NATIONAL
SURVEY BENCHMARK "V 662", LOCATED ALONG GALL
D IN ZEPHYRHILLS, FL, PUBLISHED ELEVATION =
NAVD88).

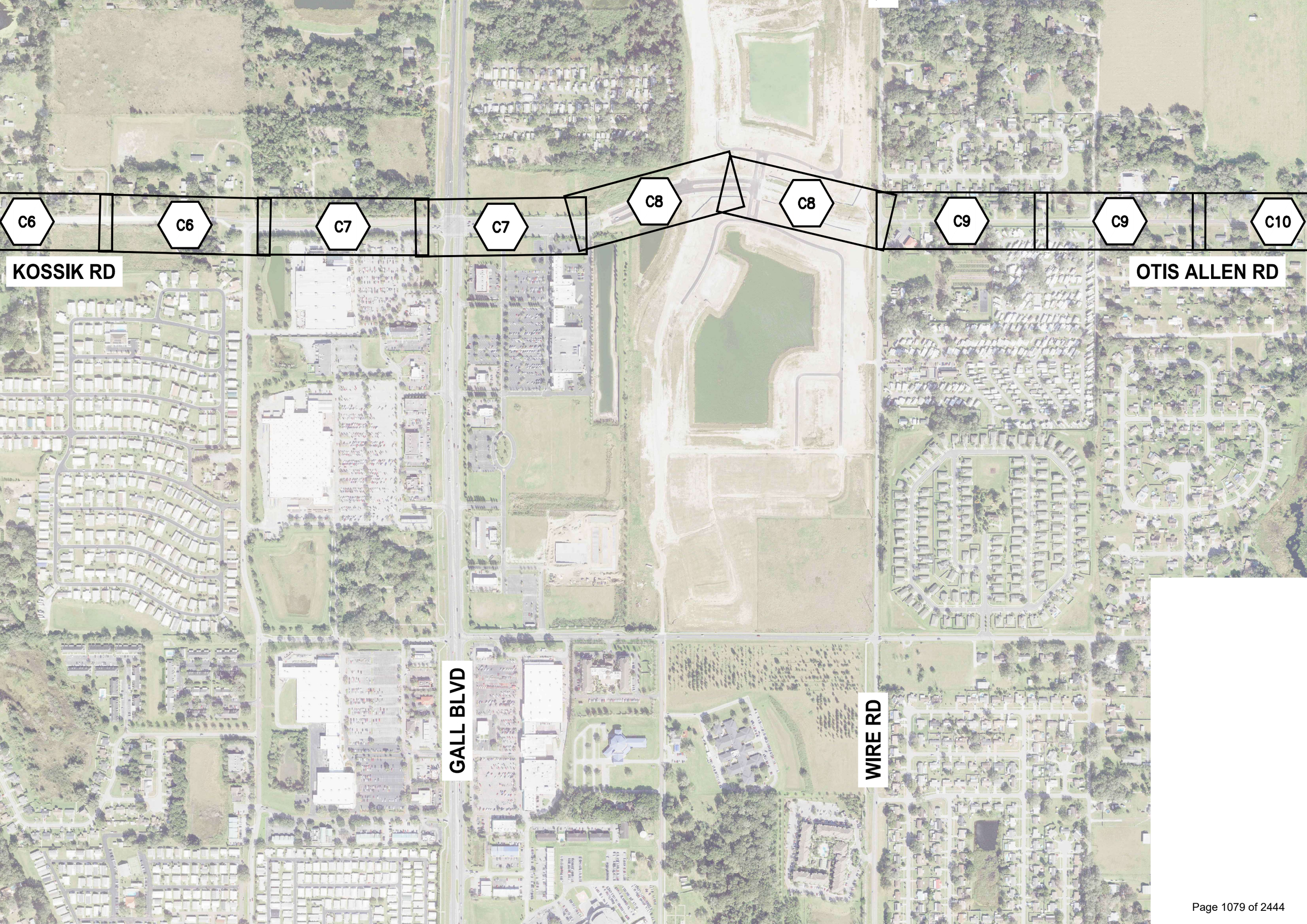
AND DISTANCES SHOWN HEREON ARE FIELD
, UNLESS OTHERWISE INDICATED.

FOR TIES TO IMPROVEMENTS INDICATES THE
THEY LIE IN RELATION TO THE BOUNDARY.

PROPERTY MAY CONTAIN LANDS THAT ARE SUBJECT
DICTION OR RESTRICTION BY ONE OR MORE OF THE
G AGENCIES: ARMY CORP. OF ENGINEERS,
T FLORIDA WATER MANAGEMENT DISTRICT
.D.) OR FLORIDA DEPARTMENT OF ENVIRONMENTAL
N (F.D.E.P.).

PG. = PAGE
EL. = ELEVATION
I.E. = INVERT ELEVATION
T.C. = TOP OF CURB
E.P. = EDGE OF PAVEMENT
PVC = POLY-VINYL CHLORIDE PIPE
RCP = REINFORCED CONCRETE PIPE
CMP = CORRUGATE METAL PIPE
HDPE = HIGH-DENSITY POLYETHYLENE PIPE
= SET 5/8" IR "DC JOHNSON LB 4514"
= SET NAIL & DISK "LB 4514"
= VERTICAL CONTROL BENCHMARK
= POWER POLE/TELEPHONE POLE
= LIGHT POLE
= GUY ANCHOR
= BOLLARD
= ROADSIGN
= REFLECTOR SIGN
= MAILBOX
= CLEANOUT
= CHAIN LINK FENCE
= VINYL FENCE
= WIRE FENCE
= WOOD FENCE
91.5' = SPOT ELEVATION
= CAMPHOR TREE (SIZE AS NOTED)
= CHERRY LAUREL TREE (SIZE AS NOTED)
= MAGNOLIA TREE (SIZE AS NOTED)
= OAK TREE (SIZE AS NOTED)
= PALM TREE (SIZE AS NOTED)
= PINE TREE (SIZE AS NOTED)

= GATE VALVE -
= AIR RELEASE VAL
W = WATER METER
W = GATE VALVE - W
= AIR RELEASE VAL
= WATER LINE WITN
= FIRE HYDRANT
= FIRE DEPARTMEN
F = GATE VALVE - FIR
R = RECLAIMED WATE
R = GATE VALVE - R
= BACKFLOW PREVE
= UTILITY VAULT/HA
= GATE VALVE
= AIR RELEASE VAL
= ELECTRIC METER
= ELECTRIC BOX
= ELECTRIC TRANSF
OHP OHP = OVERHEAD POWE
G = GAS VALVE
= GAS LINE WITNES
= TELEPHONE EQUI
= TELEPHONE PEDE
= TELEPHONE LINE
FO = FIBER OPTIC VAU
= FIBER OPTIC WIT
= TRAFFIC SIGNAL
= PEDESTRIAN SIGN
TC = TRAFFIC CONTRO
TC = TRAFFIC CONTRO
TC TC = TRAFFIC CONTRO
= ASPHALT
= CONCRETE
= GRAVEL/DIRT RO


C6
C6
C7
C7
C8
C8
C9
C9
C10
KOSSIK RD
OTIS ALLEN RD
GALL BLVD
WIRE RD

FT. KING ROAD

3+00 4+00 5+00 6+00 7+00 8+00

102+00 103+00 104+00 105+00 106+00 107+00

746 LF 6" FM-1

REMOVE & REPLACE (24± SY) CONCRETE DRIVEWAY

RIGHT OF WAY (TYP)

OPEN CUT

HDD

1-6" DI MJ TEE
2-6" DI PLUG VALVE
2-6" HDPE TO MJ FUSIBLE ADAPTER
2-6" DI MJ 11.25° BEND
1-6" DI MJ CAP
6" DR-18 PVC SPOOL PIPE
1-ARV ASSEMBLY
SEE PIPE TRANSITION DETAIL 1/C15

606 LF 6" FM-2 2/C11

DRILL PIT

HDD

HDD

FT. KING ROAD

13+00 14+00 15+00 16+00 17+00 18+00

112+00 113+00 114+00 115+00 116+00 117+00

WATERSIDE DRIVE

EXISTING 12" WM
CITY OF ZEPHYRHILLS

RIGHT OF WAY (TYP)

1-6"DI MJ 45° BEND

1-6" DI MJ 45° BEND

1-6" DI MJ TEE
2-6" DI PLUG VALVE
1-6" HDPE TO MJ FUSIBLE ADAPTER
1-6" DI MJ 11.25° BEND
1-6" DI MJ CAP
SEE PIPE TRANSITION DETAIL 1/C15

455 LF 6" FM-1

10' (TYP)

RIGHT OF WAY (TYP)

HDD

1-2" ARV ASSEMBLY

DRILL PIT

1-6" DI MJ TEE
3-6" DI PLUG VALVE
1-6" HDPE TO MJ FUSIBLE ADAPTER
1-6" DI MJ 11.25° BEND

FT. KING ROAD

31' (TYP)

EXISTING 12" WM
CITY OF ZEPHYRHILLS

KYLE DRIVE

1-6" DI MJ 45° BEND

4'

1015 LF 6" FM-1

6'-6"

RIGHT OF WAY (TYP)

1-ARV ASSEMBLY

1000 LF 6" FM-1

FT. KING ROAD

RIGHT OF WAY

1-6" DI MJ TEE
2-6" DI PLUG VALVE
1-6" HDPE TO MJ FUSIBLE ADAPTER
1-6" DI MJ 11.25° BEND
1-6" DI MJ CAP
1-ARV ASSEMBLY
SEE PIPE TRANSITION DETAIL 1/C15

PRICE DRIVE

REMOVE & REPLACE (21± SY) CONCRETE DRIVEWAY

EXISTING 12" WM CITY OF ZEPHYRHILLS

DRILL PIT

366 LF 6" FM-2

3/C12

FT. KING ROAD

OPEN CUT

HDD

RIGHT OF WAY (TYP)

FT. KING ROAD

REMOVE & REPLACE
(21± SY)
CONCRETE DRIVEWAY

REMOVE & REPLACE
(14± SY)
CONCRETE DRIVEWAY

REMOVE & REPLACE
(26± SY)
CONCRETE DRIVEWAY

RIGHT OF WAY (TYP)

REMOVE & REPLACE
(15± SY)
CONCRETE DRVIEWAY

HDD

HDD

SUNSHINE ROAD

1'-6"

1-6" DI MJ TEE
2-6" DI PLUG VALVE
1-6" HDPE TO MJ FUSIBLE ADAPTER
1-6" DI MJ 11.25° BEND
1-6" DI MJ CAP
1-ARV ASSEMBLY
SEE PIPE TRANSITION DETAIL 1/C15

251 LF 6" FM-2 4/C12

TEMPLE AVE.

BM #15
SET NAIL & DISK
"LB 4514"
EL.: 90.29

EXISTING 12" WM
CITY OF ZEPHYRHILLS

EXISTING 2" WM
CITY OF ZEPHYRHILLS

FT. KING ROAD

RIGHT OF WAY (TYP)

DRILL PIT

HDD

6' (TYP)

1-6" DI
2-6" DI
2-6" DI

1-6"DI MJ 22.5° BEND

6' MIN SEPARATION

DRILL PIT

HDD

OPEN CUT

600 LF 6" FM-1

2+00

104+00

105+00

106+00

107+00

108+00

STEEL SHED

WOOD BOARD FENCE

RIGHT-OF-WAY LINE

TOE OF SLOPE

TOP OF BANK

REMOVE & REPLACE (±79 SY) CONCRETE DRIVEWAY

1000 LF 12" WM-1

DAR LANE

12" GATE VALVE

RIGHT OF WAY (TYP)

BM #16
SET 5/8" IRON ROD
"D.C. JOHNSON LB 4514"
EL : 109.17'

KOSSIK ROAD

6' MIN SEPARATION

1000 LF 6" FM-1

REMOVE & REPLACE (±18 SY) CONCRETE DRIVEWAY

213+00

214+00

215+00

216+00

217+00

218+00

219+00

113+00

114+00

116+00

117+00

118+00

CHAIN LINK FENCE

GRADE BREAK

TOP
ERT.
TION
&
Y)
AY
" GATE VALVE
12" DI MJ 45° BENDS
123+00
124+00
125+00
126+00
127+00
128+00
WM
106 LF
12" WM-1
3'-6"
WAYFARER
DRIVE
CHAIN LINK FENCE
OHP
690 LF
12" WM-1
6'-6"
RIGHT-OF-WAY LINE
REMOVE &
REPLACE (±20 SY)
DIRT ROADWAY
RIGHT
OVE & REPLACE
1 SY) CONCRETE
VEWAY
REMOVE & REPLACE
(±21 SY) CONCRETE
DRIVEWAY
REMOVE & REPLACE
(±16 SY) CONCRETE
DRIVEWAY
REMOVE & REPLACE
(±13 SY) CONCRETE
DRIVEWAY
REMOVE & REPLACE
(±12 SY) CONCRETE
DRIVEWAY
6" DI MJ 11.25°
RIGHT OF WAY (TYP)
1002 LF
6" FM-1
WOOD BOARD FENCE
GATE
DRIVEWAY
233+00
234+00
235+00
236+00
237+00
238+00
239+00
FM
TOP OF BANK
EDGE OF PAVEMENT
8'
(TYP)
KOSSIK ROAD
BM #21
SET 5/8" IRON ROD
"D.C. JOHNSON
LB 4514"
EL.: 119.08'
BM #20
SET NAIL & DISK
"LB 4514"
EL.: 117.92'
TOE OF SLOPE
133+00
134+00
135+00
136+00
137+00
138+00
SURVEY + No.2
86'
SWALE
BACK OF CURB
2-
WM

143+00
144+00
145+00
146+00
147+00
148+00
BM #22
SET NAIL & DISK
"LB 4514"
EL.: 129.2
KOSSIK ROAD
STORM INLET
TOP EL.: 126.85'
24" RCP(W) I.E.: 120.22'
24" RCP(E) I.E.: 120.11'
18" RCP(N) I.E.: 120.22'
STORM INLET
TOP EL.: 131.79'
24" RCP(W) I.E.: 120.60'
18" RCP(N) I.E.: 121.00'
18" RCP(E) I.E.: 120.67'
SIDEWALK
TOP OF BANK
ACCESS ROAD
EDGE OF PAVEMENT
BACK OF CURB
TOE OF SLOPE
RIGHT OF WAY LINE
WM
FM

R = 38,197.19'
P.C. STA. 451+58.03 (451+51.80)
P.T. STA. 470+76.98 (470+74.00)

G 8" FORCE MAIN
ZEPHYRHILLS
115.00'
& REPLACE (±15 SY)
TE SIDEWALK
GALL BLVD
1-8" DI MJ SLEEVE
CONNECT TO EXISTING CAPPED
8"PLUG VALVE AND TEE
OPEN CUT
REMOVE & REPLACE
(±647 SY)
CONCRETE SIDEWALK
RIGHT OF WAY (TYP)
485 LF 8" FM-1
5'
(TYP)
9'
(TYP)
SANITARY MANHOLE
TOP EL.: 116.09'
CHAIN LINK FENCE
ADA WARNING PADS
CONCRETE MEDIAN
SET NAIL & DISK
"LB 4514"
EL.: 116.72'
253+00
254+00
255+00
256+00
257+00
258+00
259+00
153+00
154+00
155+00
156+00
157+00
158+00

EXISTING 6" WATER MAIN

KOSSIK ROAD

REMOVE & REPLACE (±70 SY) ASPHALT PAVEMENT

1 C19

CONNECT TO EXISTING 6" FM SEE C19 FOR CONNECTION DETAIL

EXISTING 6" RECLAIMED WATER MAIN

843 LF 8" FM-1

RIGHT OF WAY (TYP)

OPEN CUT

DRILL PIT

OTIS ALLEN ROAD

888 LF 8" FM-1

REMOVE & REPLACE (±12 SY) CONCRETE DRIVEWAY

183+00 184+00 185+00 186+00 187+00 188+00

EDGE OF PAVEMENT

SET "LB 4514" EL.: 85.60'

28' (TYP)

CHAIN LINK FENCE

VINYL FENCE

RIGHT-OF-WAY LINE

SURVEY No.2

E ADAPTER

AIL 1 C15

995 LF 8" FM-1

CASS ROAD

REMOVE & REPLACE (±25 SY) CONCRETE DRIVEWAY

REMOVE & REPLACE (±16 SY) CONCRETE DRIVEWAY

REMOVE & REPLACE (±13 SY) ASPHALT DRIVEWAY

3' (TYP)

28' (TYP)

193+00 194+00 195+00 196+00 197+00 198+00 299+00

WOOD BOARD FENCE

EDGE OF PAVEMENT

RIGHT-OF-WAY LINE

BM #31 SET NAIL & DISK "LB 4514" EL.: 87.09'

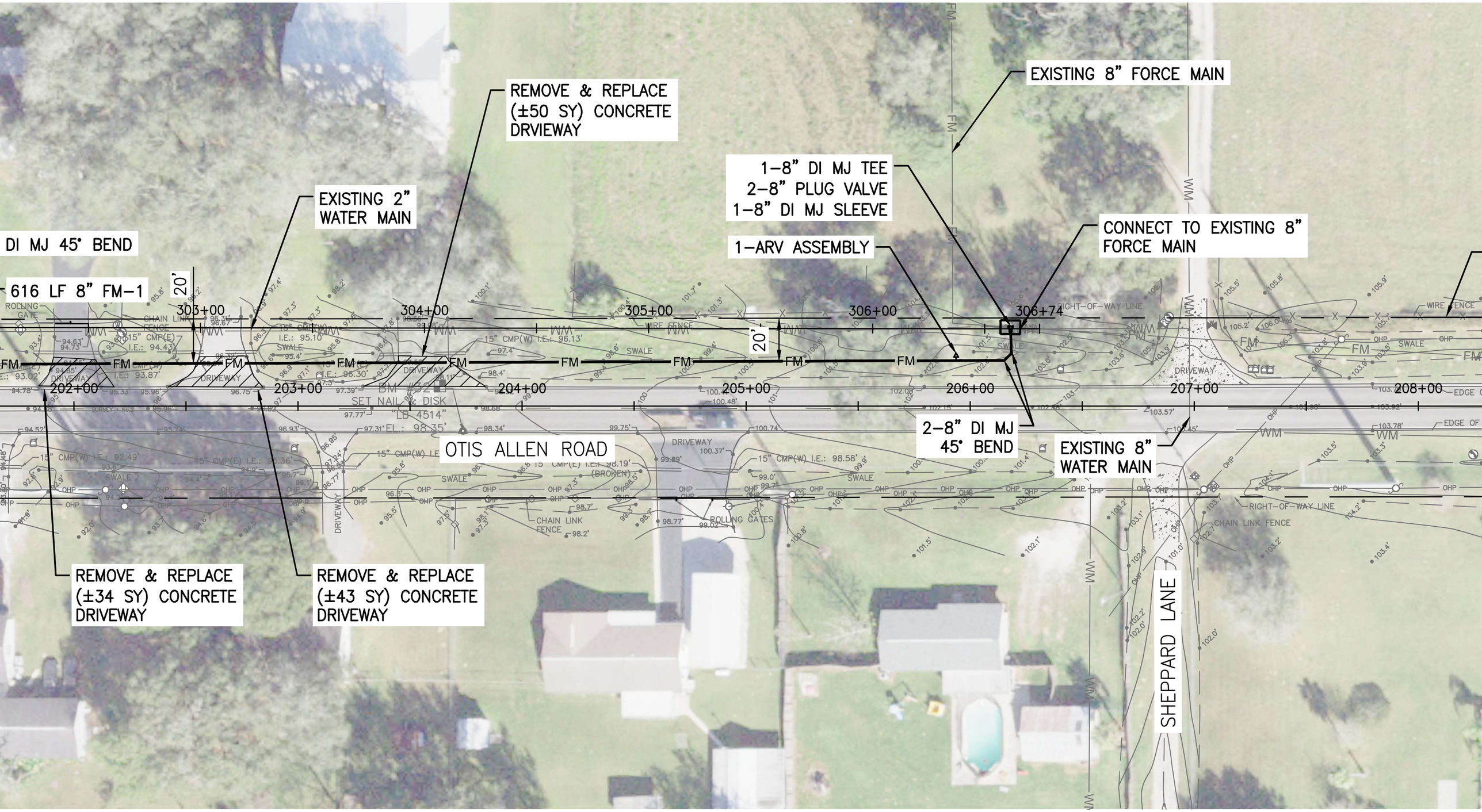
OTIS ALLEN ROAD

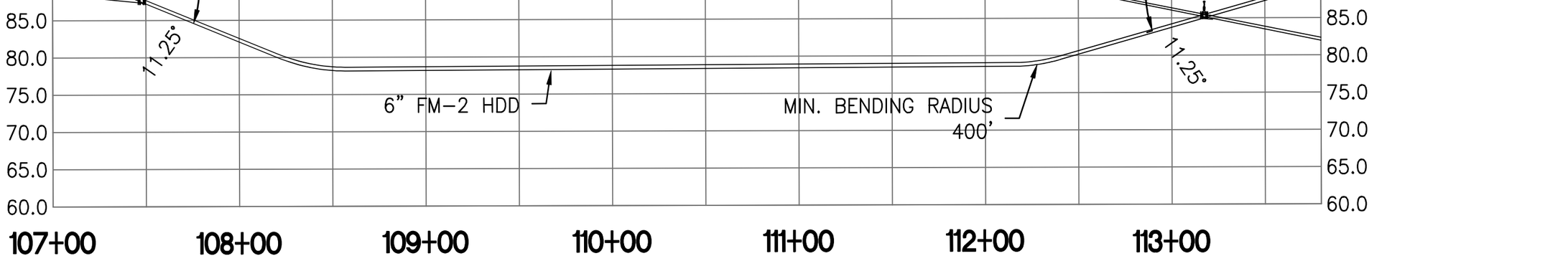
16TH ST

CHAIN LINK FENCE

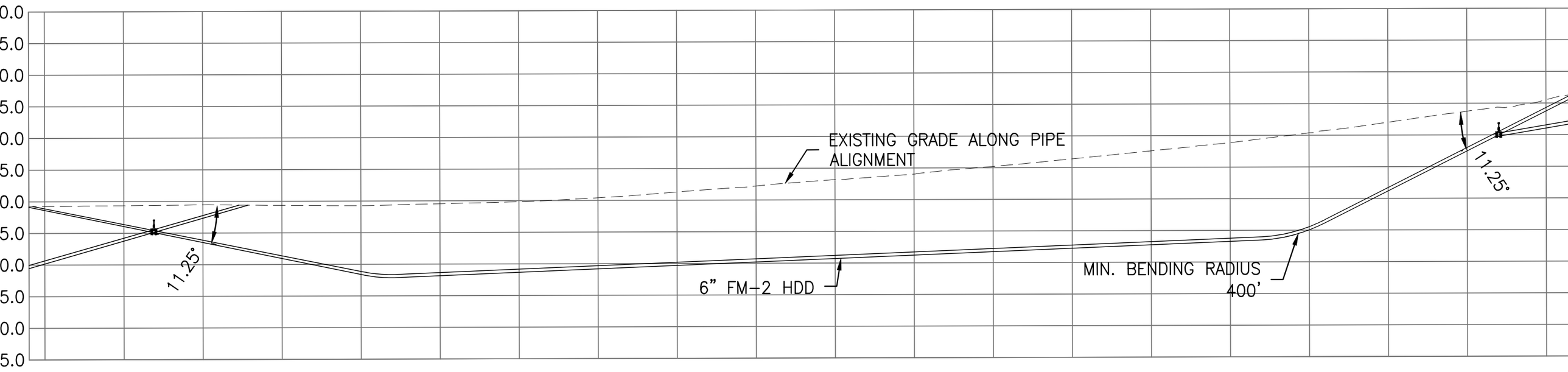
VINYL FENCE

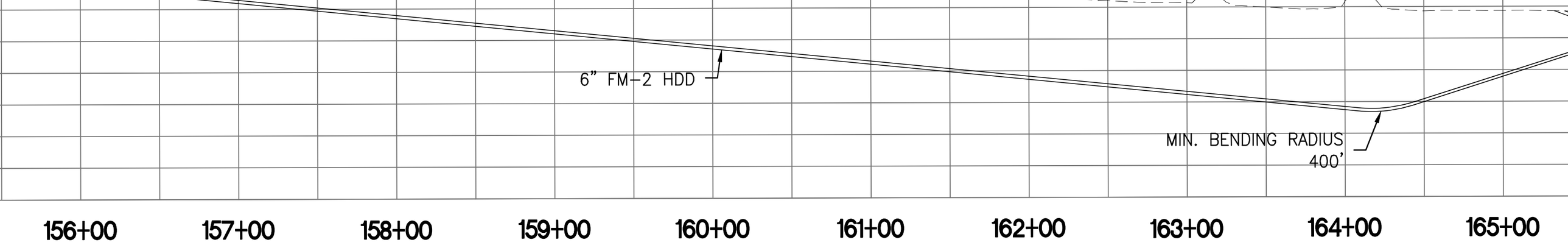
REMOVE & (±43 SY) DRIVEWAY


DI MJ 45° BEND
616 LF 8" FM-1
20'
303+00
304+00
305+00
306+00
306+74
202+00
203+00
204+00
205+00
206+00
207+00
208+00
REMOVE & REPLACE (±34 SY) CONCRETE DRIVEWAY
REMOVE & REPLACE (±43 SY) CONCRETE DRIVEWAY
EXISTING 2" WATER MAIN
REMOVE & REPLACE (±50 SY) CONCRETE DRVIEWAY
1-8" DI MJ TEE
2-8" PLUG VALVE
1-8" DI MJ SLEEVE
1-ARV ASSEMBLY
EXISTING 8" FORCE MAIN
CONNECT TO EXISTING 8" FORCE MAIN
2-8" DI MJ 45° BEND
EXISTING 8" WATER MAIN
OTIS ALLEN ROAD
SHEPPARD LANE
BM #321 SET NAIL & DISK "LB 4514" EL.: 98.35'
ROLLING GATE
CHAIN LINK FENCE
WIRE FENCE
RIGHT-OF-WAY LINE
ROLLING GATES
DRIVEWAY
SWALE
EDGE OF

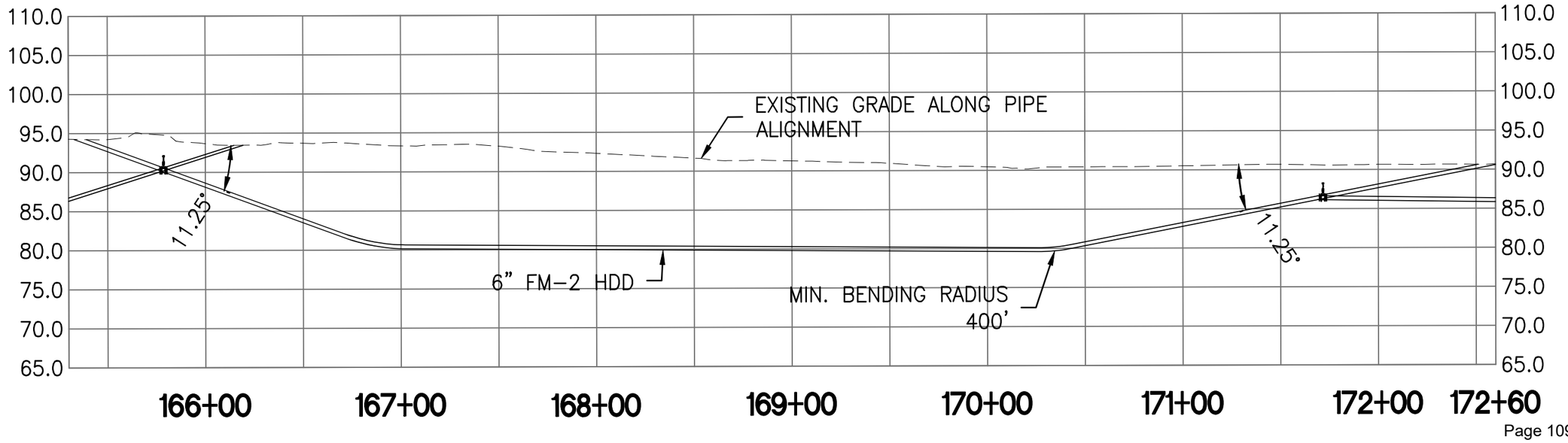


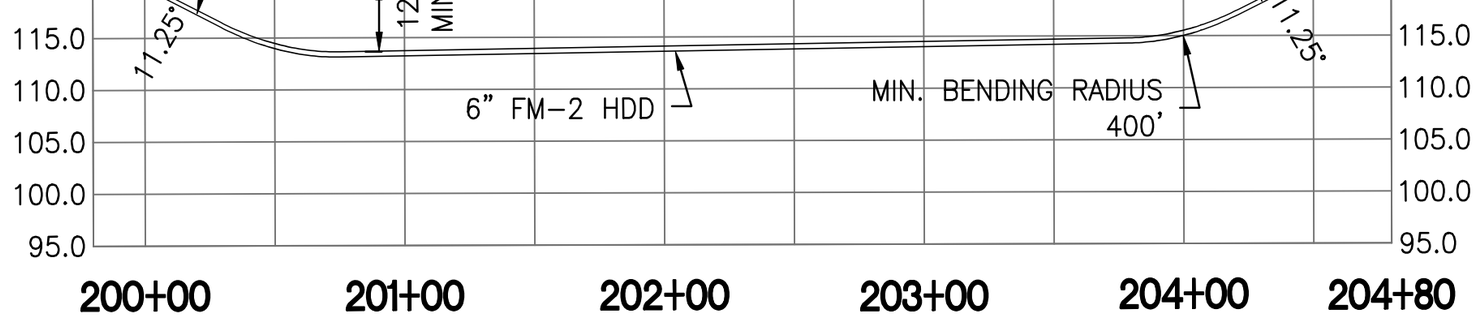
FM HDD PROFILE 1
C1





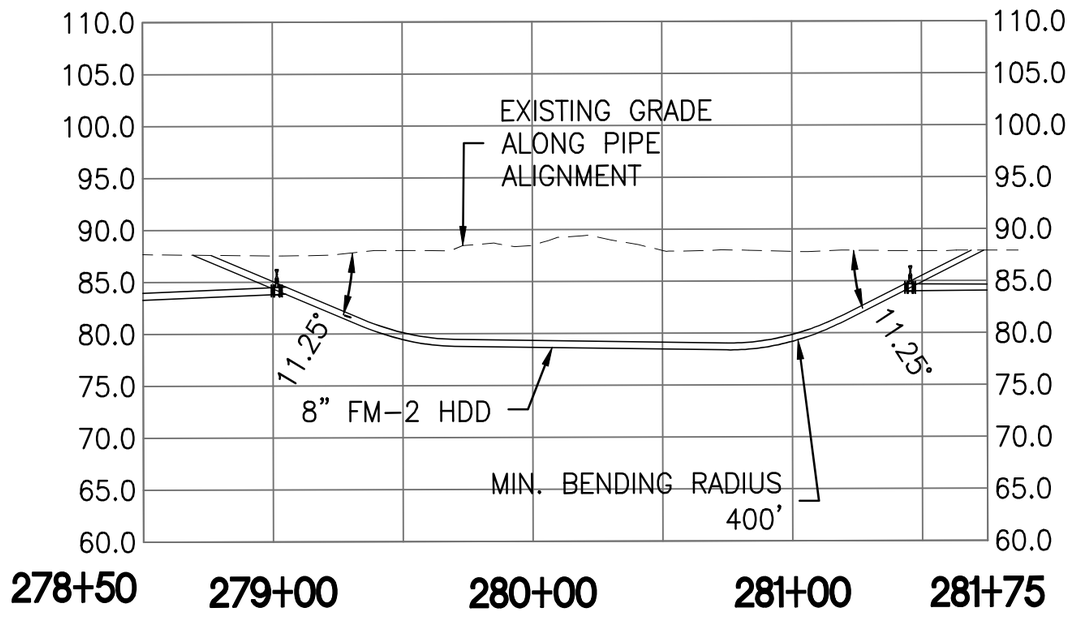
FM HDD PROFILE 3
C3





FM HDD PROFILE 5

C5



DENSITY ASTM D-1557 (98% WHEN UNDER PAVEMENT)

TE 3.

MPACTED BY HAND

LL LIFTS SHALL BE

MENT, AND SHALL BE
PERMIT ASSEMBLY

ENTS FOR COMPACTED
L IS REQUIRED.

WITH THE

RACT SPECIFICATIONS FOR
E APPLICABLE.

TIE. IF THE WIRE IS DAMAGED OR
E TRACING WIRE SHALL BE
EFT UNDER THE VALVE BOX COVER.

2, 4, AND 5 PROVIDED 1) THE LIFT
ND 2) FIELD TEST RESULTS

S	NOVEMBER 2021
42	G-3

WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

ALTERNATE OPTION 1 (SUFFICIENT COVER OR SEPARATION NOT AVAILABLE)

PROPOSED UTILITY	MINIMUM VERTICAL SEPARATION REQUIREMENTS						
	POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS	COMMENTS
POTABLE WATER	1'–0"	1'–0"(1,2)	1'–0"(1,2)	1'–0"(1)	1'–0"	1'–0"	SEE NOTE 1
GRAVITY SANITARY SEWER	1'–6"(2)	1'–0"	1'–0"	1'–6"	1'–6"(2)	1'–0"	
SEWAGE FORCE MAIN	1'–6"(2)	1'–0"	1'–0"	1'–0"	1'–6"(2)	1'–0"	SEE NOTE 2
STORM	1'–0"(1)	1'–6"	1'–0"	1'–0"	1'–0"	1'–0"	
RECLAIMED WATER	1'–0"	1'–6"	1'–6"	1'–0"	1'–0"	1'–0"	SEE NOTE 2
ELECTRIC TELECOMMUNICATIONS	1'–0"	1'–0"	1'–0"	1'–0"	1'–0"	1'–0"	

(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

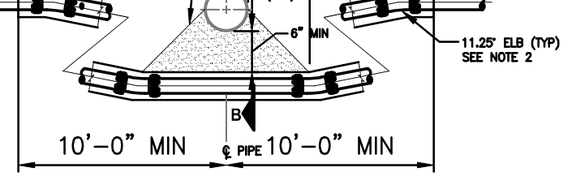
NOTES:
1. ONLY OPTION 1 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.
2. ONLY OPTION 2 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.

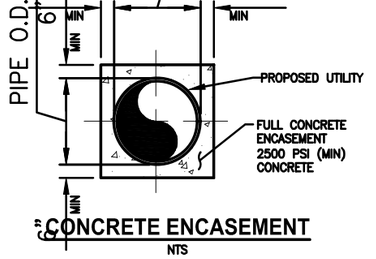
MINIMUM VERTICAL SEPARATION REQUIREMENTS

PROPOSED UTILITY	MINIMUM HORIZONTAL SEPARATION EXISTING UTILITY					
	POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS
POTABLE WATER	1'–0"	10'–0"(1,2)	10'–0"(1,2)	3'–0"(1)	3'–0"(1,3)	3'–0"
GRAVITY SANITARY SEWER	10'–0"(2)	1'–0"	1'–0"	3'–0"	3'–0"(2)	3'–0"
SEWAGE FORCE MAIN	10'–0"(2)	1'–0"	1'–0"	3'–0"	3'–0"(2)	3'–0"
STORM	3'–0"(1)	3'–0"	3'–0"	1'–0"	3'–0"	3'–0"
RECLAIMED WATER	3'–0"(1,3)	3'–0"(2)	3'–0"(2)	3'–0"	1'–0"	3'–0"
ELECTRIC TELECOMMUNICATIONS	3'–0"	3'–0"	3'–0"	3'–0"	3'–0"	2'–0"

(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

NOTE:
UTILITIES SHALL NOT BE INSTALLED WITHIN THE DRIP LINE OF TREES WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.





℄ CONCRETE ENCASEMENT
NTS

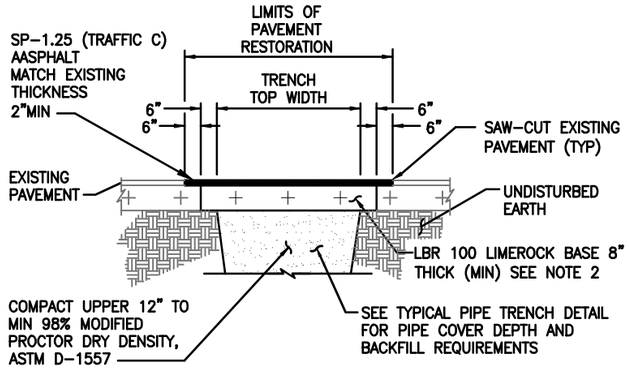
NOTES:
1. FOR PROPOSED WATER MAINS, THIS OPTION IS ONLY ALLOWED WITH APPROVAL OF THE ENGINEER AND FDEP ON A CASE BY CASE BASIS.
2. WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

ALTERNATE OPTION 2 (SUFFICIENT SEPARATION NOT AVAILABLE)

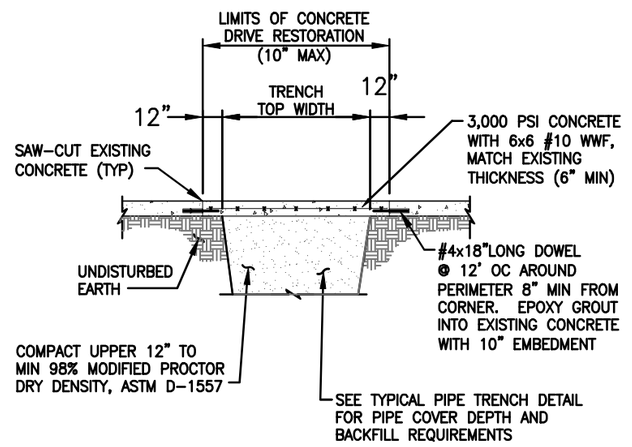
UTILITY CONFLICT

ZEPHYRHILLS UTILITIES DEPARTMENT · WATER & WASTEWATER	**CITY OF ZEPHYRHILLS STANDARD DETAILS** CITY OF ZEPHYRHILLS UTILITY DEPARTMENT 39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542 PHONE (813)780-0029 FAX (813)780-0613	NOVEMBER 2021 **G-4**

NOTE:
THE INFORMATION SHOWN ABOVE IS PROVIDED BY THE CITY OF ZEPHYRHILLS. THIS DOES NOT REPRESENT THE WORK PRODUCT OF JONES EDMUNDS AND ASSOCIATES, INC. THEY ARE PROVIDED FOR REFERENCE ONLY AND TO ENSURE COMPLIANCE WITH THE CITY OF ZEPHYRHILLS STANDARDS. UNLESS MODIFIED BY THESE CONTRACT DOCUMENTS, THESE DETAILS WILL BE THE MINIMUM STANDARDS.



NOTES:
1. ASPHALT PAVEMENT RESTORATION DETAIL APPLIES TO CITY ROADS, DRIVEWAYS, PRIVATE ROADS, DRIVES, MISCELLANEOUS PATCHES, AND SIMILAR RESTORATION.
2. NEW LIMEROCK TO BE COMPACTED TO NOT LESS THAN 98%. MODIFIED PROCTOR DRY DENSITY, ASTMD–1557.
3. FOR COUNTY ROADS AND STATE ROADS, DESIGN SHALL BE IN COMPLIANCE WITH PASCO COUNTY STANDARDS AND FDOT STANDARDS RESPECTFULLY.



NOTES:
MATCH EXISTING GRADE AND FINISH.

CONCRETE DRIVE RESTORATION

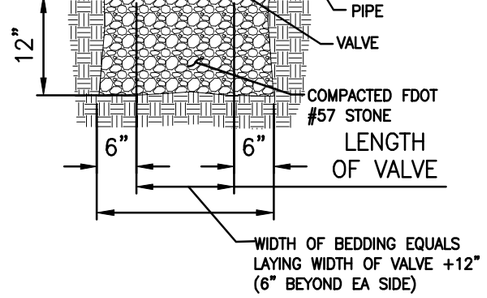
ROVIDE RESTRAINED

UMP (FDOT No

, VALVE,
TALLATION.

R SHALL BE
TO FIRE

S	NOVEMBER 2021
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NOTES:

1. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.

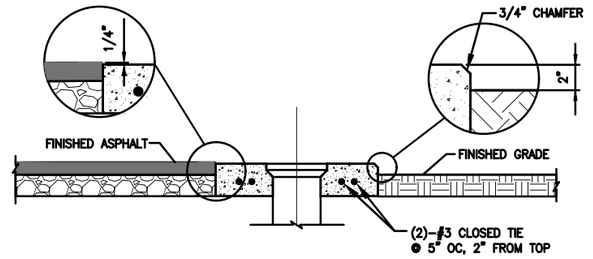
2. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.

GATE VALVE BOX

NTS

	CITY OF ZEPHYRHILLS STANDARD DETAILS CITY OF ZEPHYRHILLS UTILITY DEPARTMENT 39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542 PHONE (813)780-0029 FAX (813)780-0613	NOVEMBER 2021 **W-3**

PLAN VIEW



VALVE COLLAR AND IDENTIFICATION DISK

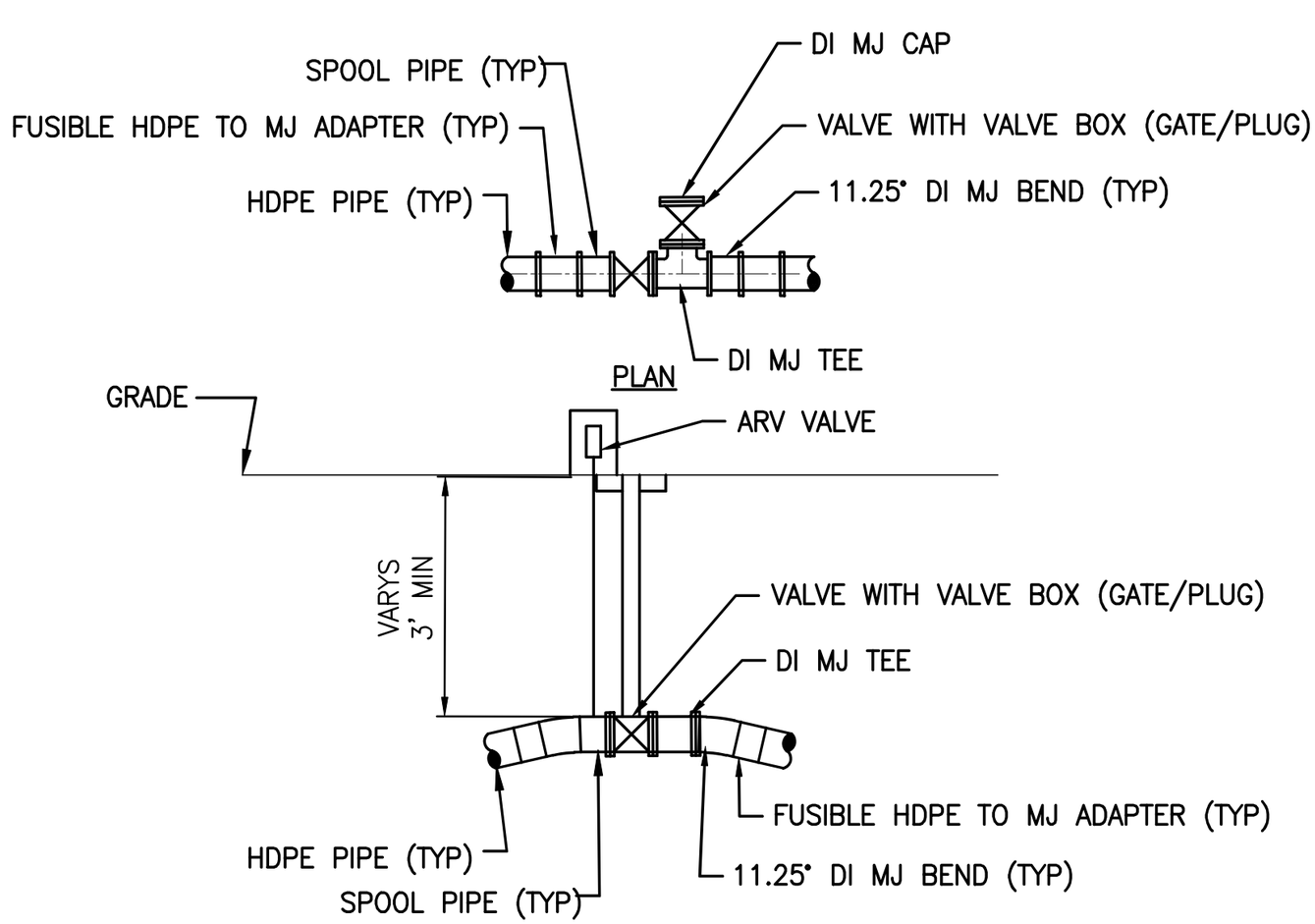
NTS

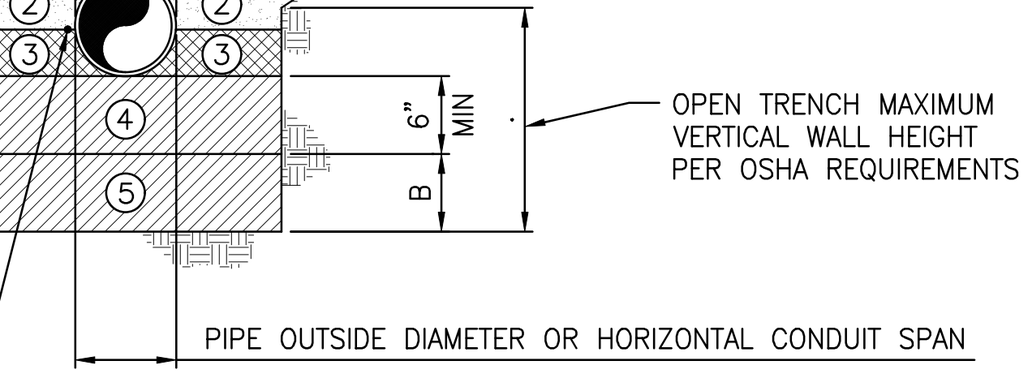
	CITY OF ZEPHYRHILLS STANDARD DETAILS CITY OF ZEPHYRHILLS UTILITY DEPARTMENT 39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542 PHONE (813)780-0029 FAX (813)780-0613	NOVEMBER 2021 **W-5**

NTER
CENT
AT AN

REETS

BLY





ZONE NO.	ZONE NAME	MATERIAL	ZONE 1 COMPACTION	ZONES 2–5 COMPACTION
①	FINAL BACKFILL	AS SPECIFIED	AT LEAST 98% MODIFIED PROCTOR MAXIMUM DRY DENSITY ASTM D–1557	AT LEAST 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY ASTM D–1557
②	INITIAL BACKFILL			
③	HAUNCHING			
④	BEDDING			
⑤	FOUNDATION			

EXCEEDING 6 INCHES, LOOSE MEASUREMENT. REFER TO ADDITIONAL NOTE 3.

EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HANICAL TAMPING. REFER TO ADDITIONAL NOTE 3.

TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS NG SHALL BE BROUGHT UP EQUALLY ON BOTH SIDES OF THE PIPE.

ATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT, AND AMPING. PROPERLY SHAPED BELL HOLES SHALL BE EXCAVATED IN THE BEDDING TO NAL NOTE 3.

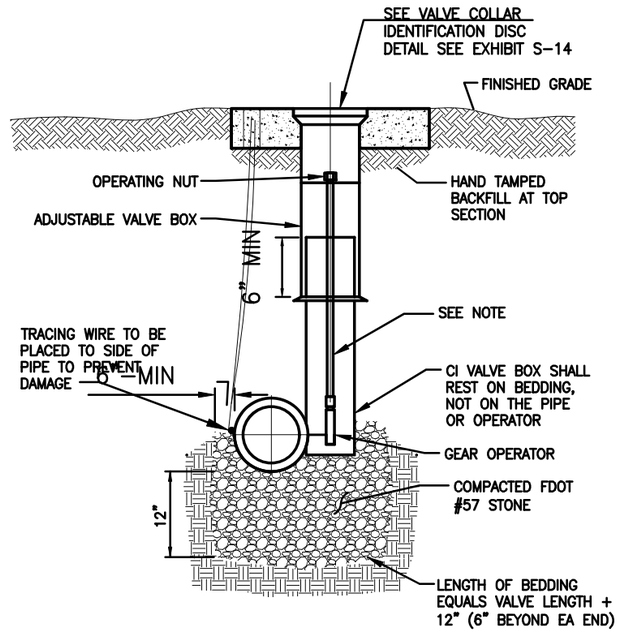
WATERED TRENCHES MEETING THE COMPACTION AND MATERIAL REQUIREMENTS FOR LACED OR REWORKED, EXCEPT FOR SHAPING OF THE BELL HOLES, AND WHERE

LE MATERIAL IS ENCOUNTERED. FOUNDATION SHALL BE IN ACCORDANCE WITH THE L NOTE 3.

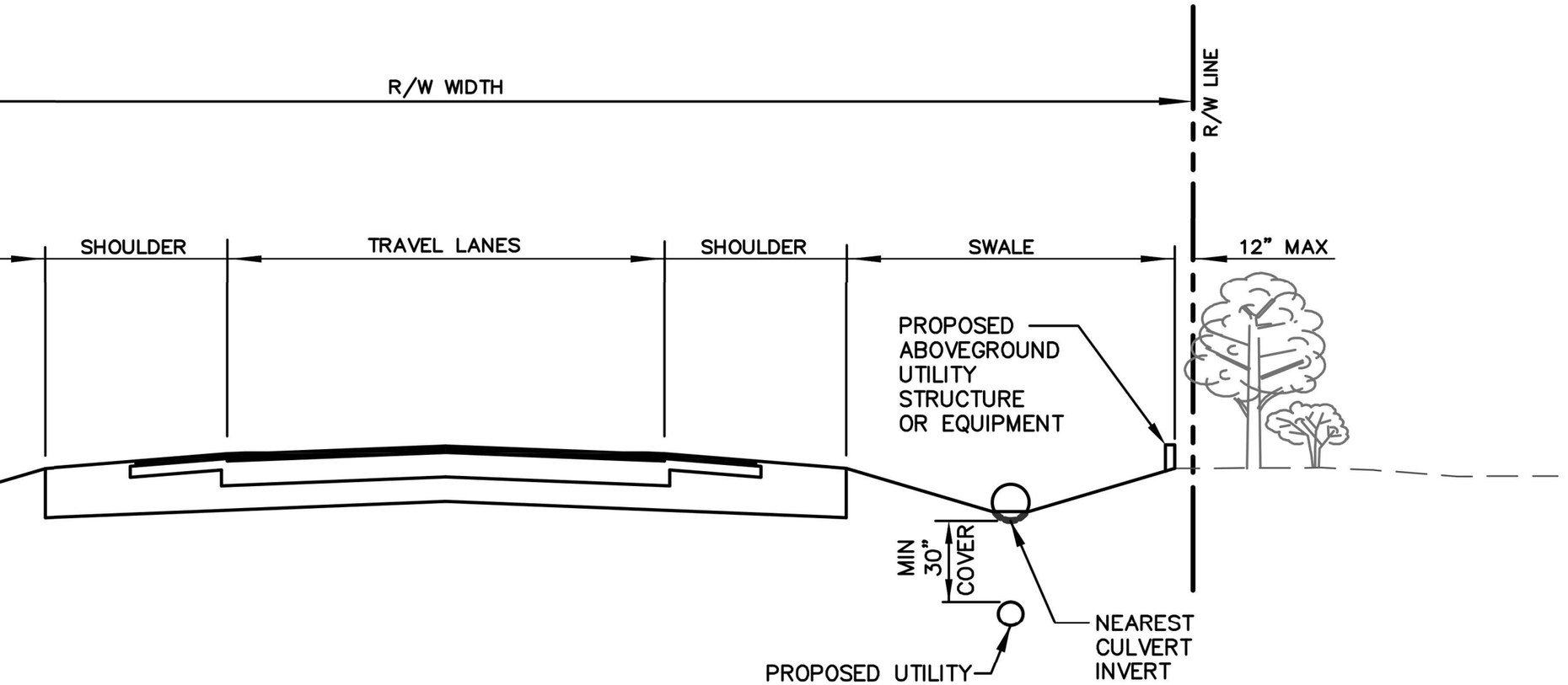
BENEATH SURFACE IMPROVEMENTS (EG, SLAB, ETC.) SEE CONTRACT SPECIFICATIONS FOR DRAWINGS FOR ASPHALT RESTORATION DETAILS.

OF THE PIPE AND ATTACHED TO THE PIPE EVERY 10' W/ A NYLON WIRE TIE. IF THE 3M WATERPROOF TYPE UF SPLICE SHALL BE INSTALLED TO REPAIR THE WIRE. THE ENDS

NOTE:
THE S–12 AND S–14 DETAILS ARE PR
REPRESENT THE WORK PRODUCT OF JO
FOR REFERENCE ONLY AND TO ENSURE
UNLESS MODIFIED BY THESE CONTRACT
STANDARDS.



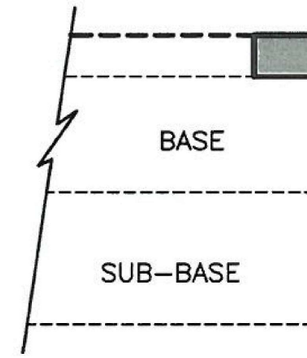
NOTES:
1. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.



TILITY INSTALLATION IN SWALE NEAR CULVERT

NTS

S APPROVED BY THE COUNTY ENGINEER.
D AND HIGHLIGHTED ON DETAIL.



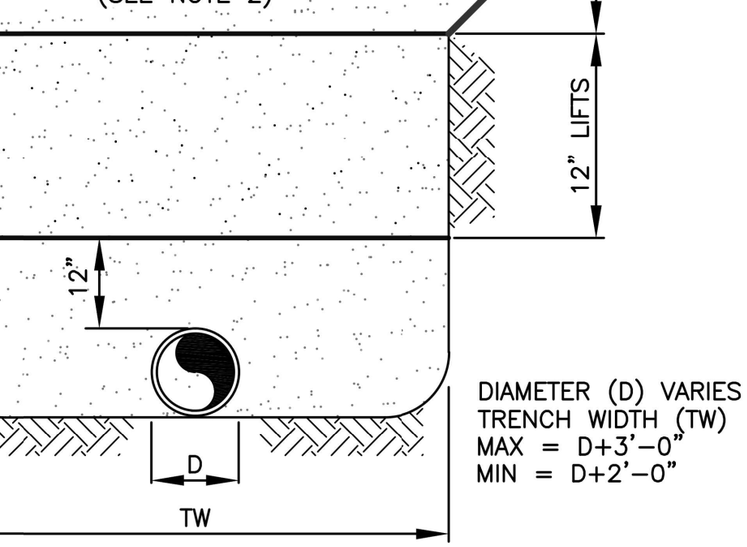
FLOWABLE FILL–CEMENT–
TYPE 1, 75–100 LBS/CY
28 DAY 100 PSI
(EXCAVATABLE)

COMPACTED SAND OR
SELECT MATERIAL

UNDISTURBED

NOTE:
NO DEVIATIONS TO THIS DETAIL WILL BE

C:\Standards\Conceptual\301_Utility-Install_Culvert.dwg



TWICE THE ORIGINAL PAVEMENT THICKNESS WITH A MINIMUM
BE SP 12.5 OR TYPE S-3 ASPHALT, AND FC-3 IF REQUIRED.

EW MATERIAL NOT REUSED FROM EXCAVATION. ACCEPTABLE
E ABC OR BETTER ASPHALT PLACED AT A TOTAL THICKNESS

LACED IN SIX (6) INCH LIFT WITH EACH LIFT COMPACTED TO
ECHANICAL TAMPERS.

LACED IN TWELVE (12) INCH LIFTS WITH EACH LIFT
USING APPROPRIATE COMPACTING EQUIPMENT.

BASE SHALL BE CONSTRUCTED IN LIFTS NOT GREATER THAN
KNESS, AND HAVE A DENSITY EQUAL TO **98% OF FM5-521**.

ABOVE AREA 1 UP TO THE BOTTOM OF THE RESTORED BASE.
FDOT STANDARD SPECIFICATIONS SECTION 121. IF FLOWABLE
FILL, THE AMOUNT OF COVER ABOVE TOP OF PIPE TO AREA 2

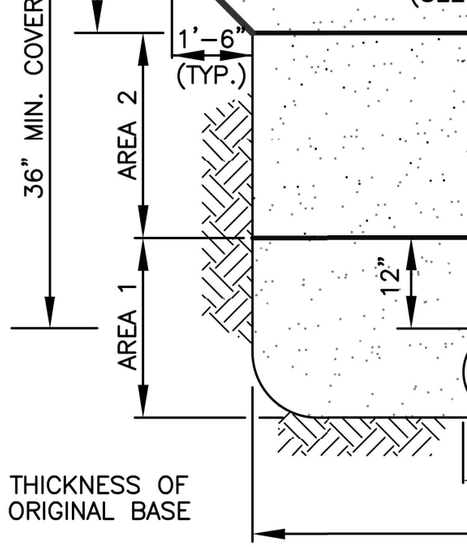
County Engineering Inspections verifying open cut restoration
of permit or gurantee, if applicable. Material and thickness
ting shall be Pasco County Services Department Testing
oads, Storm Drainage and Utilities; October 2006.

UNLESS APPROVED BY THE COUNTY ENGINEER.
ENTIFIED AND HIGHLIGHTED ON DETAIL.

OPEN CUT RESTORATION

Sheet No.
1 of 1

F:\CADD Support\Details\PROJECT MANAGEMENT STANDARD DETAILS\102_OpenCut-Restore.dwg



NOTES

1. REPLACEMENT ASPHALT SHALL BE TWICE THE
OF TWO (2) INCHES AND SHALL BE SP 12.5
2. REPLACEMENT BASE SHALL BE NEW MATERIAL
BASE ALTERNATIVE SHALL BE TYPE ABC OR B
OF SIX (6) INCHES.
3. AREA 1 – BACKFILL SHALL BE PLACED IN SIX
98% OF ASTM FM5-521 USING MECHANICAL T
4. AREA 2 – BACKFILL SHALL BE PLACED IN TW
COMPACTED TO **98% OF FM5-521** USING APP
5. AREA 3 – LIMEROCK (LBR 100) BASE SHALL
SIX (6) INCHES COMPACTED THICKNESS, AND
6. FLOWABLE FILL MAY BE PLACED ABOVE AREA
MIX DESIGN SHALL CONFORM TO FDOT STANDA
FILL IS USED FOR TRENCH BACKFILL, THE AM
MAY BE REDUCED TO 6 INCHES.

Tests shall be submitted to Pasco County Engine
is per general notes before release of permit or
verification shall be required. All testing shall be
Specificatiions for Construction of Roads, Storm

NOTE:
NO DEVIATIONS TO THIS DETAIL WILL BE PERMITTED UNLESS API
ANY PROPOSED ALTERATIONS SHALL BE CLEARLY IDENTIFIED AND

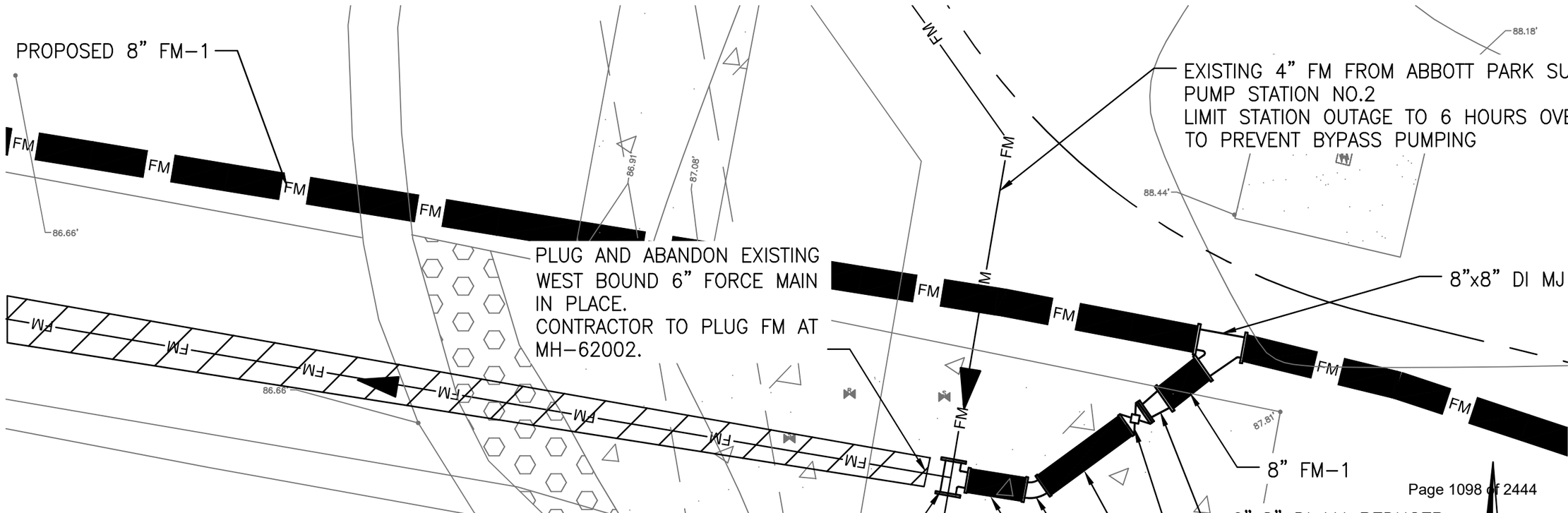
PASCO COUNTY
ENGINEERING SERVICES

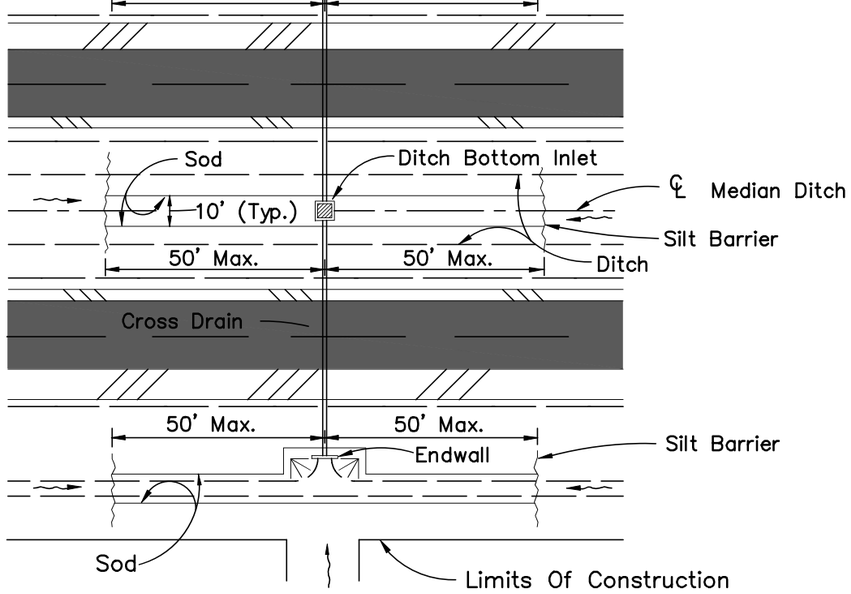
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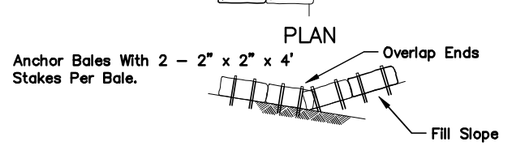
NOTE
SIDE

CO



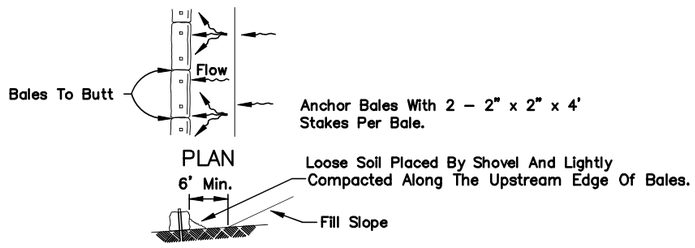


DITCH INSTALLATIONS AT DRAINAGE STRUCTURES



ELEVATION

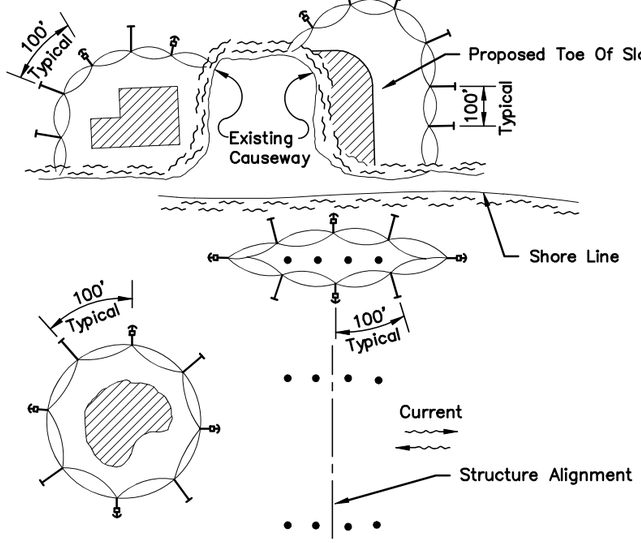
TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES TOWARD THE TOE OF SLOPE



ELEVATION

TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES AWAY FROM THE TOE OF SLOPE

BARRIERS FOR FILL SLOPES



NOTES:

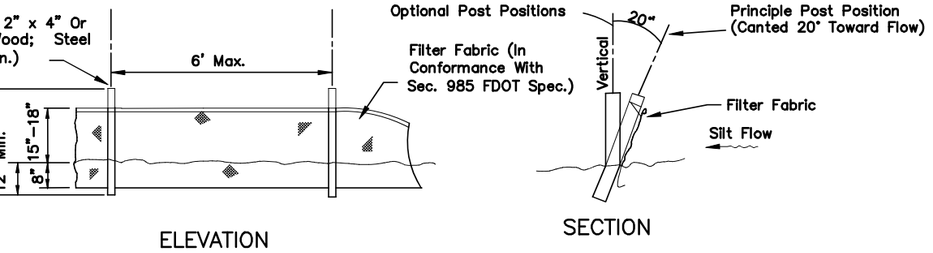
1. Turbidity barriers are to be used in all permanent bodies of
2. Number and spacing of anchors dependent on current velocit
3. Deployment of barrier around pile locations may vary to acc
4. Navigation may require segmenting barrier during construction
5. For additional information see Section 104 of the FDOT Stand

TURBIDITY BARRIER APPLI

TUR

HAY BALE LOCATION

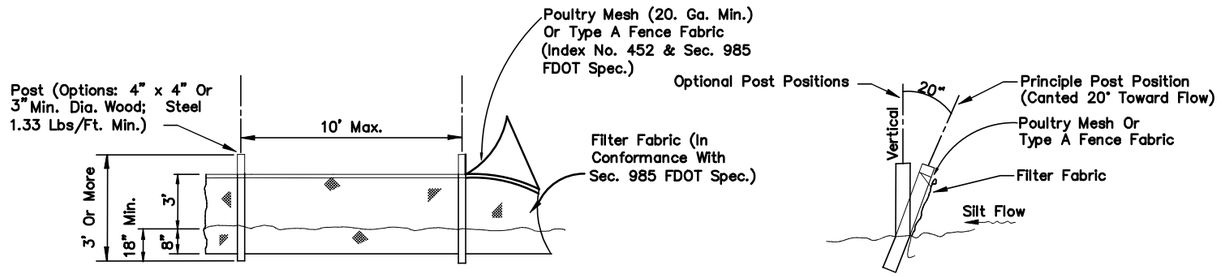
(D–901)
N.T.S.



ELEVATION

SECTION

TYPE III SILT FENCE

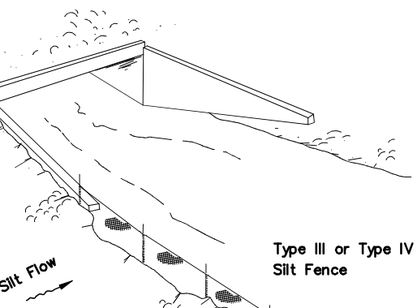


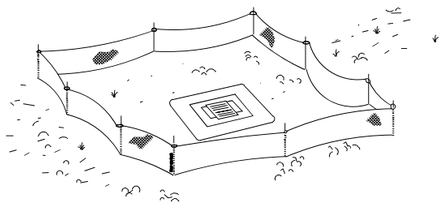
ELEVATION

SECTION

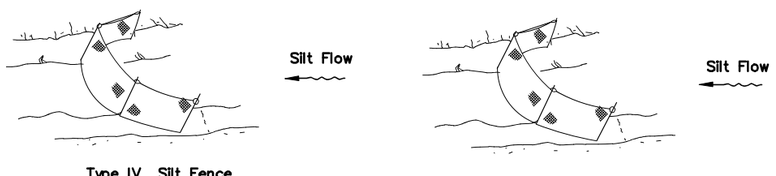
Note: Silt Fence to be paid for under the contract lump sum price for Erosion and Sediment Control.

TYPE IV SILT FENCE

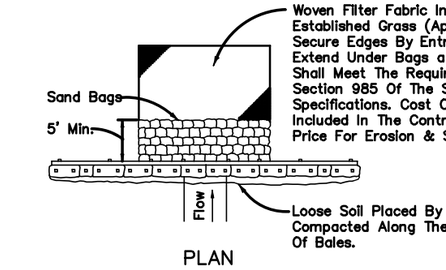




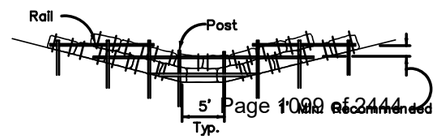
Type III Or Type IV Silt Fence Protection Around Ditch Bottom Inlets

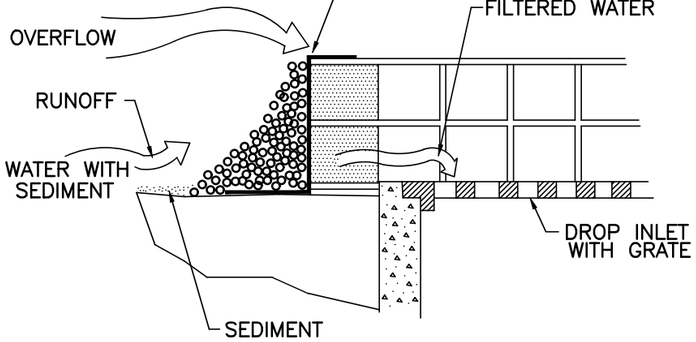


Type IV Silt Fence



PLAN





SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.

BLOCK & GRAVEL DROP INLET SEDIMENT FILTER

(D–904)
N.T.S.

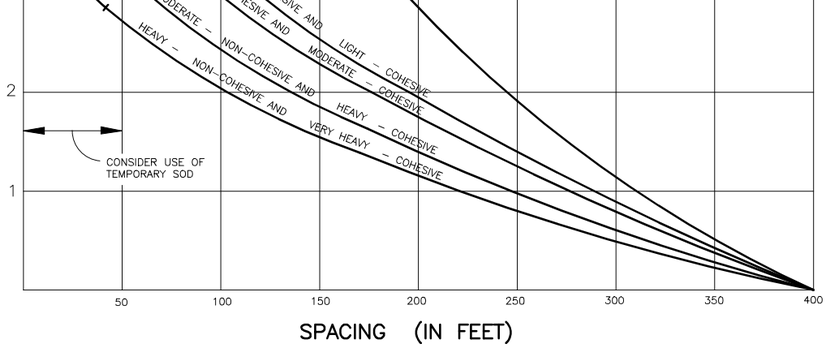
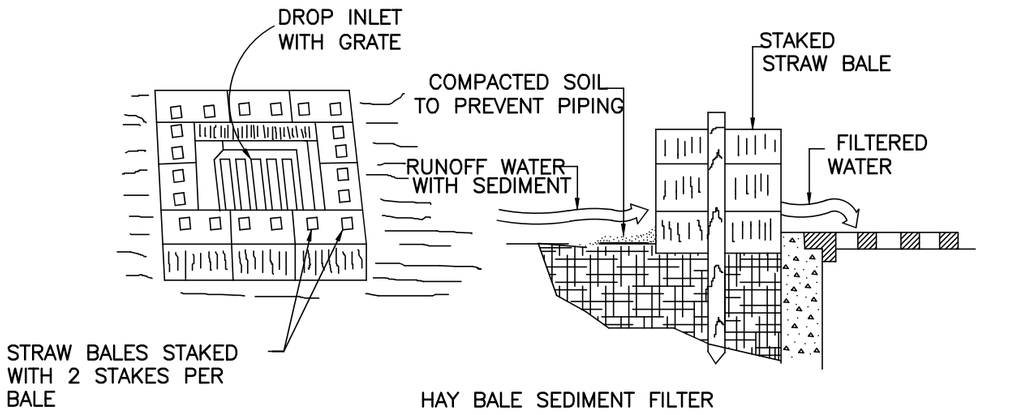


CHART I

RECOMMENDED SPACING FOR TYPE I AND TYPE II HAY BALE BARRIERS, AND TYPE III AND TYPE IV SILT FENCES AND PAVED DITCH HAY BALE BARRIERS

SPACING RECOMMENDATION FOR SILT FENCES & HAY BALES

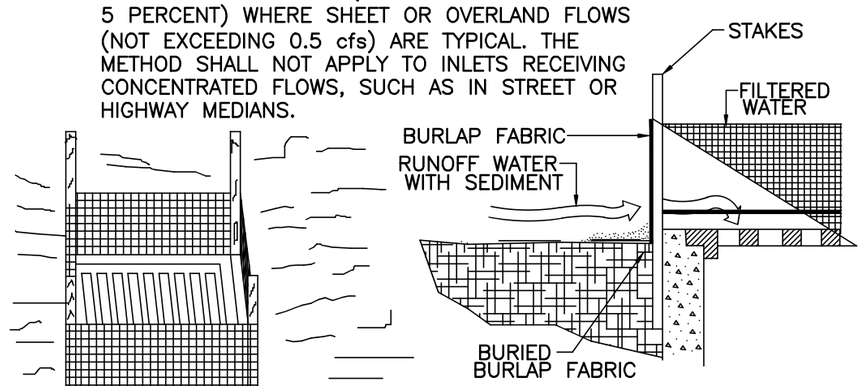
(D–906)
N.T.S.

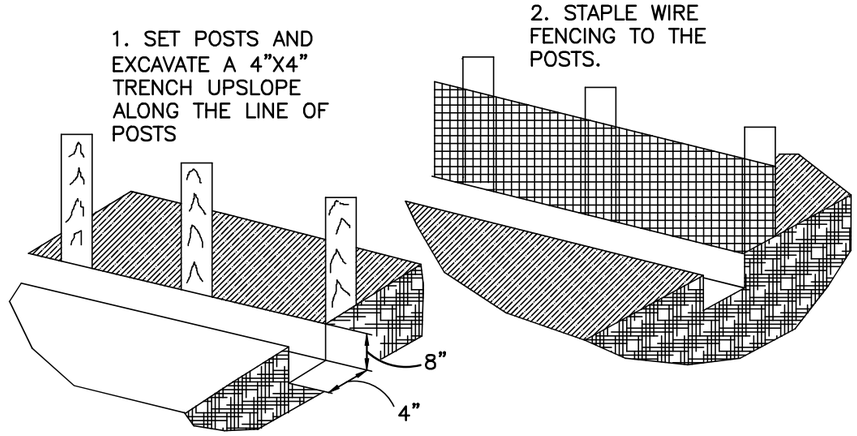


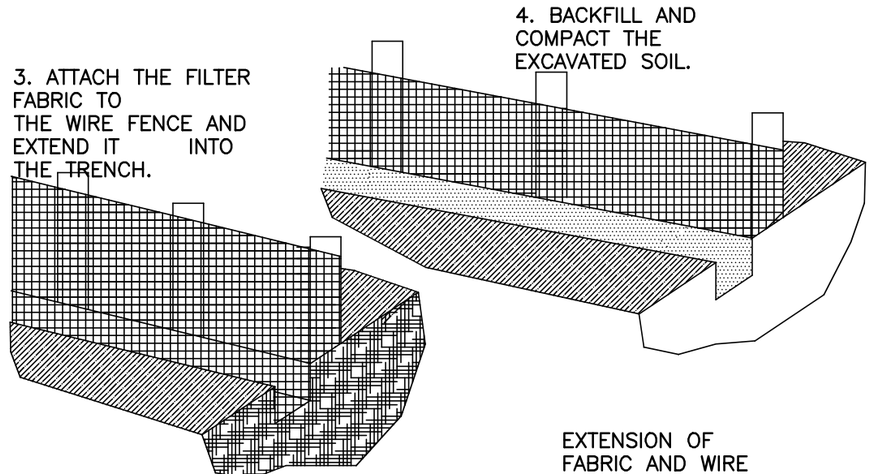
HAY BALE SEDIMENT FILTER

SPECIFIC APPLICATION

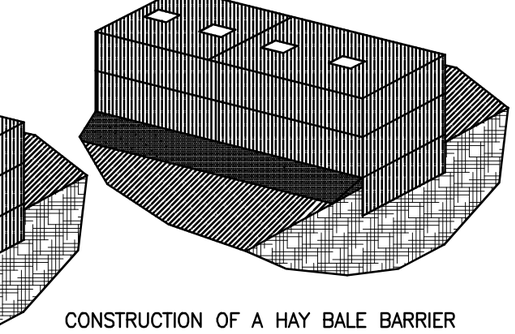
THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 cfs) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.



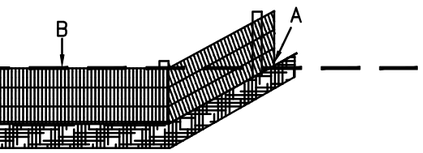




EXTENSION OF FABRIC AND WIRE



CONSTRUCTION OF A HAY BALE BARRIER



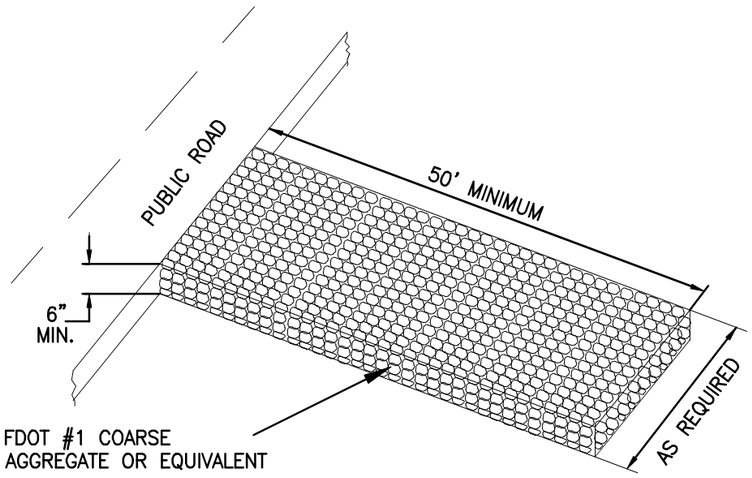
D BE HIGHER THAN POINT B

HAY BALE BARRIER IN DRAINAGE WAY

NOTE: THIS REPRESENT THE OPTIMUM LOCATION OF THE TEMPORARY SEDIMENT BASIN. OTHER ON–SITE LOCATIONS MAY ALSO BE APPROPRIATE.

IER CONSTRUCTION DETAILS

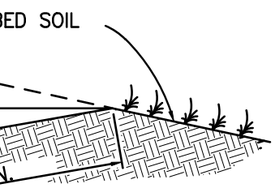
(D–913)
N.T.S.



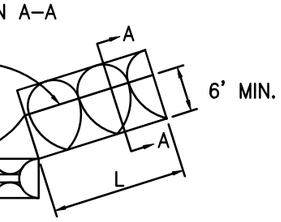
STABILIZED CONSTRUCTION ENTRANCE

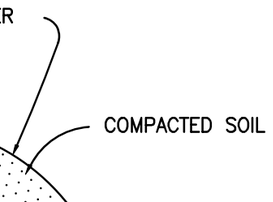
N.T.S.

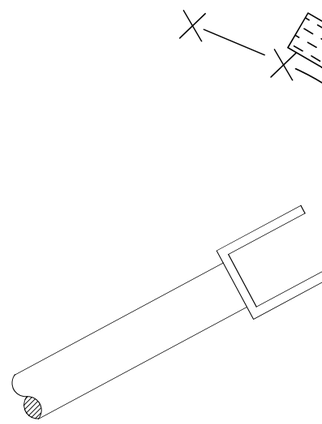
TEMPORAR



N A–A







NOTES:

1. Cover or deactivate pedestrian traffic signal display(s) controlling closed crosswalks.

2. Place pedestrian LCDs across the full width of the closed sidewalk.

3. For post mounted signs located near or adjacent to a sidewalk, maintain a minimum 7' clearance from the bottom of the sign panel to the surface of the sidewalk.

4. "Sidewalk Closed" signs (R9-XX) may be mounted on pedestrian LCDs in accordance with the manufacturer's instructions.

5. Omit the Advance Closure LCD if it blocks access to other pedestrian facilities (e,g,, transit stops, residences, or business entrances).

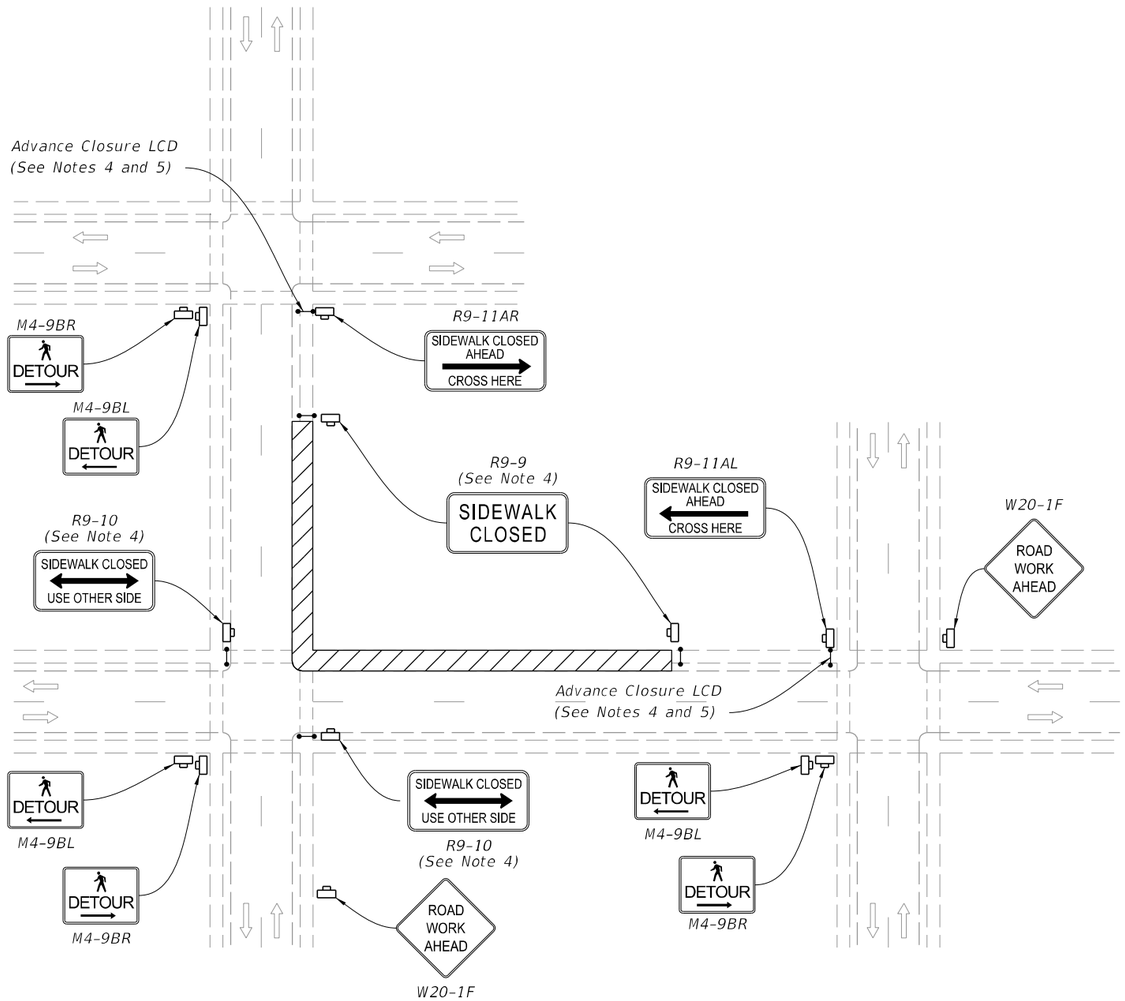
SYMBOLS:

Work Area

Work Zone Sign

Pedestrian Longitudinal Channelizing Device (LCD)

Lane Identification and Direction of Traffic



PEDESTRIAN DETOUR

9/21/2021 12:26:54 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2022-23 STANDARD PLANS	SIDEWALK CLOSURE	INDEX	SHEET
11/01/20					102-660	1 of 2

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

NOTES:

1. L = Taper Length
   B = Buffer Length
   X = Work Zone Sign Distance
   See Index 102-600 for "L", "B", "X", channelizing device spacing values.

2. Provide a 5' wide temporary pedestrian way with a maximum cross-slope of 0.02, except where space restrictions warrant a minimum width of 4'. Provide a 5' x 5' passing space for temporary pedestrian ways less than 5' in width at intervals not to exceed 200'.

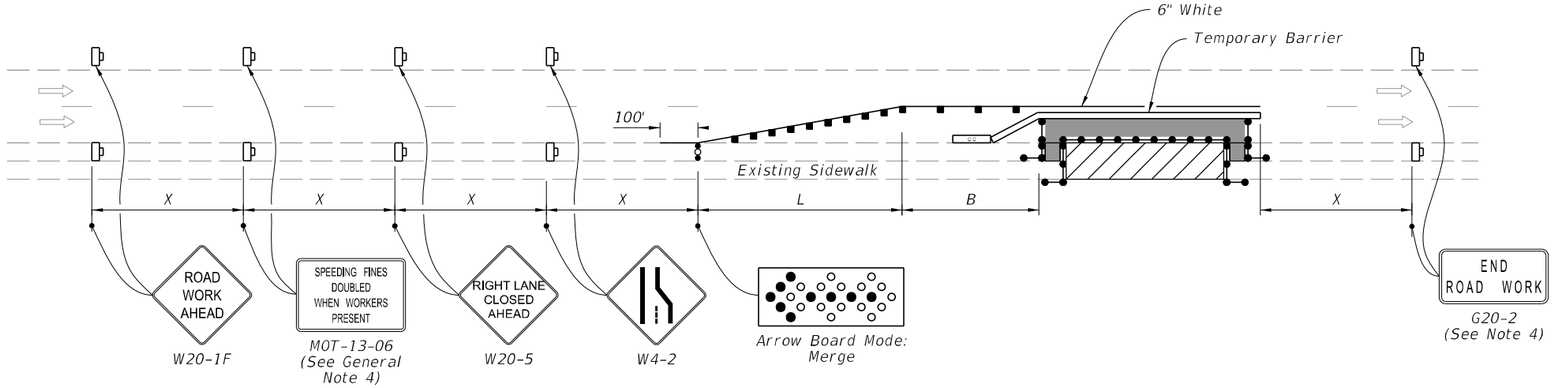
3. When temporary pedestrian ways require curb ramps, meet the requirements of Index 522-002. Detectable warnings are not required for curb ramps diverting pedestrian traffic into a closed lane.

4. The "Speeding Fines Doubled When Workers Present" signs (M0T-13-06) and "End Road Work" signs (G20-2), along with associated work zone sign distances, may be omitted when the work operation will be in place for 24 hours or less.

5. Pedestrian Diversion Option 2 may only be used when called for in the Plans or as approved by an Engineer.

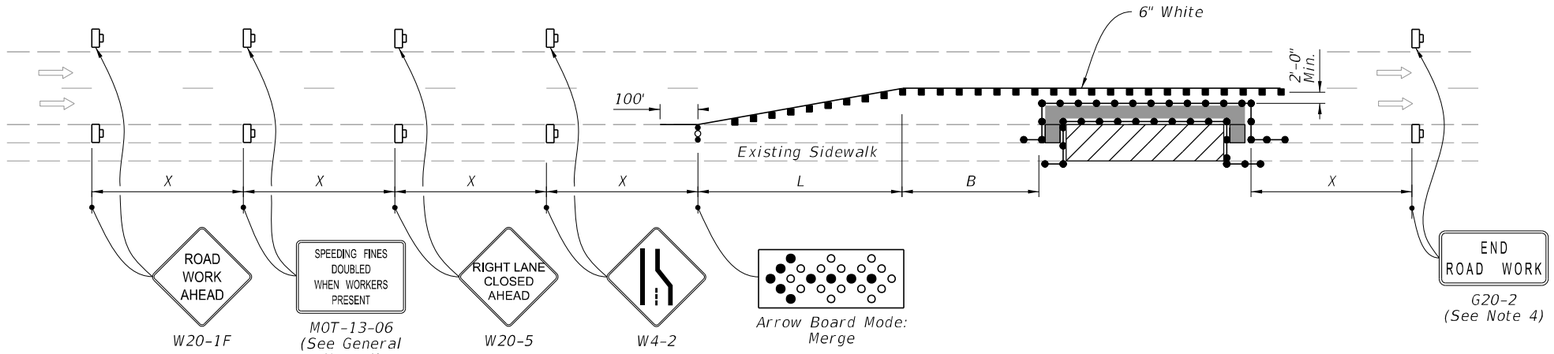
SYMBOLS:

- Work Area
- Temporary Pedestrian Way
- Channelizing Device (See Index 102-600)
- Pedestrian Longitudinal Channelizing Device (LCD)
- Work Zone Sign
- Arrow Board
- CC Crash Cushion
- Lane Identification and Direction of Traffic



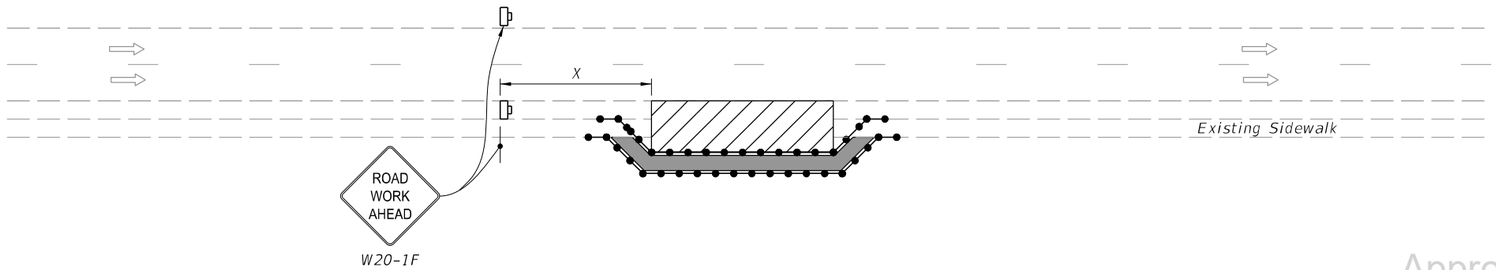
PEDESTRIAN DIVERSION - OPTION 1

(Temporary Barrier Shown, Low Profile Barrier Similar)



PEDESTRIAN DIVERSION - OPTION 2

(Work Zone Speed 35 mph or Less)



PEDESTRIAN SPECIAL DETOUR

Approved
2023-H-798-00203
James A. Meyer
10/30/2023

9/21/2021 12:26:55 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	SIDEWALK CLOSURE	INDEX	SHEET
11/01/21						102-660	2 of 2

Florida Department of Transportation

Stormwater Pollution Prevention



Background

The National Pollutant Discharge Elimination System (NPDES) is a stormwater permitting program managed by the Florida Department of Environmental Protection (FDEP) which regulates construction activities that disturb one or more acres of land. Projects less than one acre may by regulated if the activity is part of a larger common plan of development or sale that will exceed the one acre threshold. Disturbance includes clearing, grading, and excavating.

The NPDES program also regulates municipal storm sewer systems that serve highways, area roads, and streets in your neighborhood.

Construction Requirements for Regulated Activities

- Prepare and implement a Stormwater Pollution Prevention Plan (SWPPP)
- Obtain and abide by Department of Environmental Protection (DEP) Generic Permit for Construction Activities.

For more information regarding NPDES Generic Permits for Construction Activities, please visit:
http://www.dep.state.fl.us/water/stormwater/npdes/construction1.htm

To apply using the online FDEP Business Portal, please visit:
http://www.fldepportal.com/go/apply-build/

Contacts

To report **illicit discharges**, please contact the appropriate representative listed below:

Citrus County	Citrus County BOCC – Engineering	Primary: 352-527-5446
Hernando County	Hernando County Stormwater	Primary: 352-754-4062
Hillsborough County	Hillsborough County Environmental Protection Commission	Primary: 813-627-2600 Alternate: 813-744-5671
Pasco County	Pasco County Stormwater	Primary: 727-834-3611
Pinellas County	Pinellas County Environmental Management	Primary: 727-464-4187 Alternate: 727-464-4703
FDOT Right-of-Way	District Maintenance	Primary: 813-975-6639

Environmental Protection Agency (EPA) **Spill Response Hotline: 1-800-424-8802**
For EPA spill and environmental violation information, please visit:
https://www.epa.gov/pesticide-incidents/report-spills-and-environmental-violations

Preventing Illicit Discharges & Water Pollution

Illicit Discharges are point sources of discharge which negatively impact stormwater, which eventually drains into local natural water systems. The most effective way to eliminate these discharges is to dispose of pollutants correctly. Below are common examples:

- Yard clippings & leaves
- Fertilizers and herbicides
- Pet waste
- Trash
- Used motor oil / filters
- Antifreeze/transmission fluid
- Paint
- Solvent / degreaser
- Cooking Grease





For more information on the proper disposal of wastes contact FDEP at 813-470-5700

Approved
2023H-23-00203
James A. Meyer
10/30/2023

FDEP (Water) Permit

FLORIDA DEPARTMENT OF
Environmental Protection

Southwest District Office
13051 North Telecom Parkway #101
Temple Terrace, Florida 33637-0926

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

Notification of Acceptance of Use of a General Permit

PERMITTEE:
John Bostic, Utilities Director
City of Zephyrhills
5335 8th Street
Zephyrhills, Florida 33542
jbostic@ci.zephyrhills.fl.us

Permit Number: 0082640-167-DSGP/02
Issue Date: October 16, 2023
Expiration Date: October 15, 2028
County: Pasco
Project Name: North Side LS Phase 3
Water Supplier: City of Zephyrhills
PWS ID: 651-2020

Dear Mr. Bostic:

On October 3, 2023, the Florida Department of Environmental Protection received a "*Notice of Intent to Use the General Permit for Construction of Water Main Extensions for PWSs*" [DEP Form No. 62-555.900(7)], under the provisions of Rule 62-4.530 and Chapter 62-555, Florida Administrative Code (F.A.C.). The proposed project includes the construction of approximately 4,000 linear feet of 12-inch diameter water main pipe(s). The project is located on Kossik Road between Fort King Road and Green Slope Drive.

Based upon the submitted Notice and accompanying documentation, this correspondence is being sent to advise that the Department does not object to the use of such general permit at this time. Please be advised that the permittee is required to abide by Rule 62-555.405, F.A.C., all applicable rules in Chapters 62-4, 62-550, 62-555, F.A.C., and the General Conditions for All General Drinking Water Permits (found in 62-4.540, F.A.C.).

All construction must be in accordance with this permit. Before commencing work on project changes for which a construction permit modification is required per 62-555.536(1), the permittee shall submit to the Department a written request for a permit modification. Each such request shall be accompanied by one copy of a revised construction permit application, the proper processing fee and one copy of either a revised preliminary design report or revised drawings, specifications and design data.

The permittee shall comply with all sampling requirements specific to this project. These requirements are attached for review and implementation.

Pursuant to Rule 62-555.345, F.A.C., the permittee shall submit a certification of construction completion [DEP Form No. 62-555.900(9)] to the Department and obtain approval, or clearance, from the Department before placing any water main extension constructed under this general permit into operation for any purpose other than disinfection or testing for leaks.

Within 30 days after the sale or legal transfer of ownership of the permitted project that has not been cleared for service in total by the Department, both the permittee and the proposed permittee shall sign and submit an application for transfer of the permit using Form 62-555.900(8), F.A.C., with the appropriate fee. The permitted construction is not authorized past the 30-day period unless the permit has been transferred.

This permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project, per Rule 62-4.030, F.A.C.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

for Shannon Herbon
Program Administrator
Permitting & Waste Cleanup Program
Southwest District

Enclosures: Clearance Requirements/Utilities Separation Requirements

cc:
Kenneth A. Fraser, P.E., Jones Edmunds, kfraser@jonesedmunds.com
Belinda Oliver, DEP SWD, Belinda.Oliver@floridadep.gov

A Civil Penalty May Be Incurred

if this project is placed into operation before obtaining a clearance from this office.

Requirements for clearance upon completion of projects are as follows:

1) **Clearance Form**
Submission of a fully completed Department of Environmental Protection (DEP) Form 62-555.900(9) *Certification of Construction Completion and Request for Clearance to Place Permitted PWS Components into Operation*.

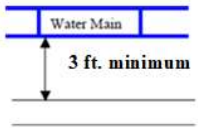
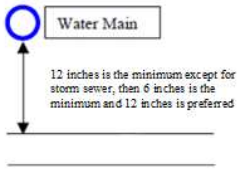
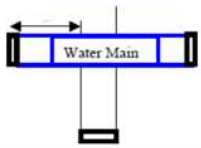
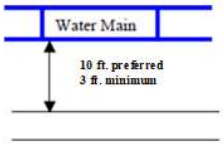
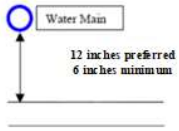
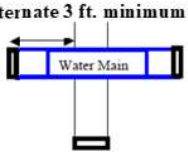
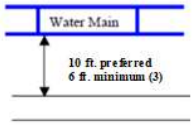
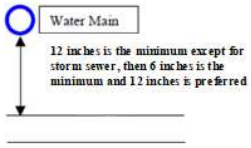
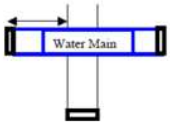
2) **Record Drawings, if deviations were made**
Submission of the portion of record drawings showing deviations from the DEP construction permit, including preliminary design report or drawings and specifications, if there are any deviations from said permit (Note that it is necessary to submit a copy of only the portion of record drawings showing deviations and not a complete set of record drawings.).

3) **Bacteriological Results**
Copies of satisfactory bacteriological analysis (a.k.a. Main Clearance), taken within sixty (60) days of completion of construction, from locations within the distribution system or water main extension to be cleared, in accordance with Rules 62-555.315(6), 62-555.320(12)(d), 62-555.350(6), 62-555.340, and 62-555.330, F.A.C. and American Water Works Association (AWWA) Standard C 651-92, as follows:

- Connection to existing system
- The end point of the proposed addition
- Any water lines branching off a main extension
- Every 1,200 feet on straight runs of pipe

Each location shall be sampled on two consecutive days, at least 6 hours apart, with sample points and chlorine residual readings clearly indicated on the report. A sketch or description of all bacteriological sampling locations must also be provided.

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH RULE 62-555.314, F.A.C.

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)			Alternate 3 ft. minimum 
Vacuum Sanitary Sewer			Alternate 3 ft. minimum 
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)			Alternate 6 ft. minimum 
On-Site Sewage Treatment & Disposal System	10 ft. minimum	---	---

(1) Water main should cross over other pipe. When water main must be below other pipe, the minimum separation is 12 inches.

(2) Reclaimed water regulated under Part III of Chapter 62-610, F.A.C.

(3) 3 ft. for gravity sanitary sewer where the bottom of the water main is laid at least 6 inches above the top of the gravity sanitary sewer.

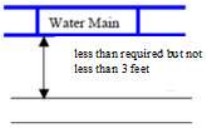
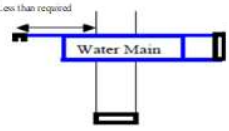
(4) Reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

EXCEPTIONS TO MINIMUM SEPARATION REQUIREMENTS

Where it is not technically feasible or economically sensible to comply with the requirements of 62-555.314(1) or (2), F.A.C., **the Department shall allow exceptions to these requirements if suppliers of water or construction permit applicants provide technical or economic justification for each exception and provide alternative construction features that afford a similar level of reliability and public health protection.**

Acceptable alternative construction features include the following:

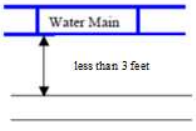
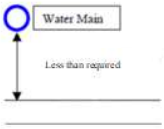
LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(a), F.A.C.

Other Pipe	Horizontal Separation	Joint Spacing @Crossings (Full Joint Centered)
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

Where an underground water main is being laid **less than the required minimum horizontal distance** from another pipeline and where an underground water main is **crossing another pipeline and joints in the water main are being located less than the required minimum distance from joints in the other pipeline**:

1. Use of pressure-rated pipe conforming to the American Water Works Association standards incorporated into Rule 62- 555.330, F.A.C., for the other pipeline if it is a gravity- or vacuum-type pipeline;
2. Use of welded, fused, or otherwise restrained joints for either the water main or the other pipeline; **or**
3. Use of watertight casing pipe or concrete encasement at least four inches thick for either the water main or the other pipeline.

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(b), F.A.C.

Other Pipe	Horizontal Separation	Crossings
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

Where an underground water main is being laid **less than three feet horizontally** from another pipeline and where an underground water main is **crossing another pipeline and is being laid less than the required minimum vertical distance from the other pipeline**:
Use of pipe, or casing pipe, having high impact strength (i.e., having an impact strength at least equal to that of 0.25-inch-thick ductile iron pipe) or concrete encasement at least four inches thick for both the water main **and** for the other pipeline if it is new and is conveying wastewater or reclaimed water.

Disclaimer – This document is provided for your convenience only. Please refer to Rule 62-555.314, F.A.C., for additional construction requirements.

FDEP (Wastewater) Permit

FLORIDA DEPARTMENT OF Environmental Protection

Southwest District Office
13051 North Telecom Parkway #101
Temple Terrace, Florida 33637-0926

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

October 30, 2023

PERMITTEE:
John Bostic III, Utilities Director
City of Zephyrhills
5335 8th Street
Zephyrhills, FL 33542
JBostic@ci.zephyrhills.fl.us

PERMIT NUMBER:	CS51-0030492-127-DWC/CG
ISSUE DATE:	October 30, 2023
EXPIRATION DATE:	October 29, 2028
COUNTY:	Pasco
PROJECT NAME:	North Side LS Phase 3
WWTF NAME:	City of Zephyrhills WWTF
FACILITY ID:	FLA012744

NOTIFICATION OF ACCEPTANCE OF USE OF A GENERAL PERMIT

Dear Mr. Bostic,

This letter acknowledges receipt of your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System for the subject project. Our Office received the Notice on October 5, 2023.

This is to advise you that the Department does not object to your use of this general permit for the following: Approximately 12,400 linear feet of six-inch diameter force main pipe(s) and 5,070 linear feet of eight-inch diameter force main pipe(s).

Please note the attached requirements apply to your use of this general permit for constructing the proposed domestic wastewater collection/transmission system.

You are further advised that the construction activity must conform to the description contained in your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System and that any deviation may subject the permittee to enforcement action and possible penalties.

If you have any questions, please contact Christine Smykowski at 813-470-5777 or via email at Christine.Smykowski@FloridaDEP.gov.

Sincerely,

for Shannon Herbon
Program Administrator
Permitting & Waste Cleanup Program
Southwest District

Copies furnished to:
Kenneth A. Fraser, P.E., Jones Edmunds & Associates, Inc., kfraser@jonesedmunds.com
Michael L. Clark, P.E., Jones Edmunds & Associates, Inc., mclark@jonesedmunds.com
Keyla Virgilio, Jones Edmunds & Associates, Inc., kvirgilio@jonesedmunds.com
Marisol Alvarez, Jones Edmunds & Associates, Inc., malvarez@jonesedmunds.com
Christine Smykowski, DEP SWD, Christine.Smykowski@FloridaDEP.gov

REQUIREMENTS FOR USE OF THE GENERAL PERMIT FOR DOMESTIC WASTEWATER COLLECTION/TRANSMISSION SYSTEMS:

1. This general permit is subject to the general permit conditions of Rule 62-4.540, F.A.C., as applicable. This rule is available at the Department's Internet site at: https://floridadep.gov/water/water/content/water-resource-management-rules#ww *[62-4.540]*

2. This general permit does not relieve the permittee of the responsibility for obtaining a dredge and fill permit where it is required. *[62-604.600(6)(b)1]*

3. This general permit cannot be revised, except to transfer the permit. *[62-604.600(6)(b)2]*

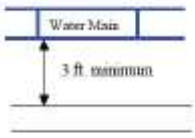
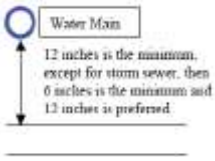
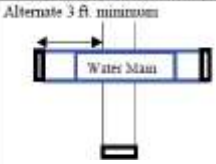
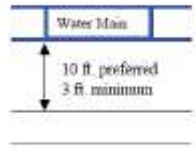
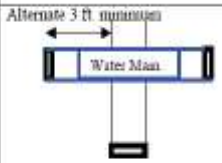
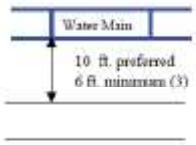
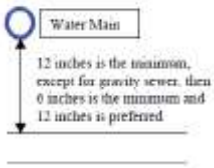
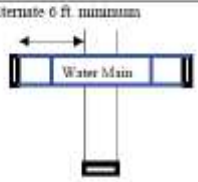
4. This general permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project. *[62-4.030]*

5. Upon completion of construction of the collection/transmission system project, and before placing the facilities into operation for any purpose other than testing for leaks or testing equipment operation, the permittee shall submit to the Department's Southwest District Office Form 62-604.300(3)(b), Request for Approval to Place a Domestic Wastewater Collection/Transmission System into Operation. This form is available at the Department's Internet site at: https://floridadep.gov/water/domestic-wastewater/content/domestic-wastewater-forms *[62-604.700(2)]*

6. The new or modified collection/transmission facilities shall not be placed into service until the Department clears the project for use. *[62-604.700(3)]*

7. Abnormal events shall be reported to the Department's Southwest District Office in accordance with Rule 62-604.550, F.A.C. For unauthorized spills of wastewater in excess of 1000 gallons per incident, or where information indicates that public health or the environment may be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER (800) 320-0519 as soon as practical, but no later than 24 hours from the time the permittee or other designee becomes aware of the circumstances. Unauthorized releases or spills less than 1000 gallons per incident are to be reported orally to the Department's Southwest District Office within 24 hours from the time the permittee, or other designee becomes aware of the circumstances. *[62-604.550]*

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH RULE 62-555.314, F.A.C.

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @ Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)			
Vacuum Sanitary Sewer			
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)			
On-Site Sewage Treatment & Disposal System	10 ft. minimum	---	---

(1) Water main should cross above other pipe. When water main must be below other pipe, the minimum separation is 12 inches.

(2) Reclaimed water regulated under Part III of Chapter 62-610, F.A.C.

(3) 3 ft. for gravity sanitary sewer where the bottom of the water main is laid at least 6 inches above the top of the gravity sanitary sewer.

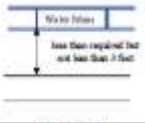
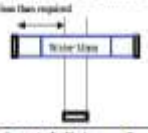
(4) Reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

EXCEPTIONS TO MINIMUM SEPARATION REQUIREMENTS

Where it is not technically feasible or economically sensible to comply with the requirements of 62-555.314(1) or (2), F.A.C., **the Department shall allow exceptions to these requirements if suppliers of water or construction permit applicants provide technical or economic justification for each exception and provide alternative construction features that afford a similar level of reliability and public health protection.**

Acceptable alternative construction features include the following:

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(a), F.A.C.

Other Pipe	Horizontal Separation	Joint Spacing @ Crossings (Full Joint Centered)
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

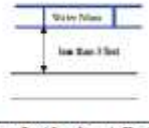
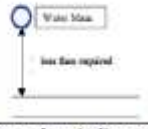
Where an underground water main is being laid **less than the required minimum horizontal distance** from another pipeline and where an underground water main is **crossing another pipeline and joints in the water main are being located less than the required minimum distance from joints in the other pipeline**:

1. Use of pressure-rated pipe conforming to the American Water Works Association standards incorporated into Rule 62-555.330, F.A.C., for the other pipeline if it is a gravity- or vacuum-type pipeline;

2. Use of welded, fused, or otherwise restrained joints for either the water main or the other pipeline; **or**

3. Use of watertight casing pipe or concrete encasement at least four inches thick for either the water main or the other pipeline.

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(b), F.A.C.

Other Pipe	Horizontal Separation	Crossings
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

Where an underground water main is being laid **less than three feet horizontally** from another pipeline and where an underground water main is **crossing another pipeline and is being laid less than the required minimum vertical distance from the other pipeline**:

Use of pipe, or casing pipe, having high impact strength (i.e., having an impact strength at least equal to that of 0.25-inch-thick ductile iron pipe) or concrete encasement at least four inches thick for both the water main **and** for the other pipeline if it is new and is conveying wastewater or reclaimed water.

Disclaimer – This document is provided for your convenience only. Please refer to Rule 62-555.314, F.A.C., for additional construction requirements.

ERP

PATH=Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\053-01 NORTH SIDE LS PHASE 3\DESIGN&CONSTRUCTION\CAD\DWGS\GENERAL\2611005301-G01.DWG

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22x34

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

CITY OF ZEPHYRHILLS, FLORIDA

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH ACIE FRASER, P.E. ON DATE ADJACENT TO SEAL.

Kenneth A Fraser — Digitally signed by Kenneth A Fraser Date: 2023.11.08 13:27:24 -05'00'

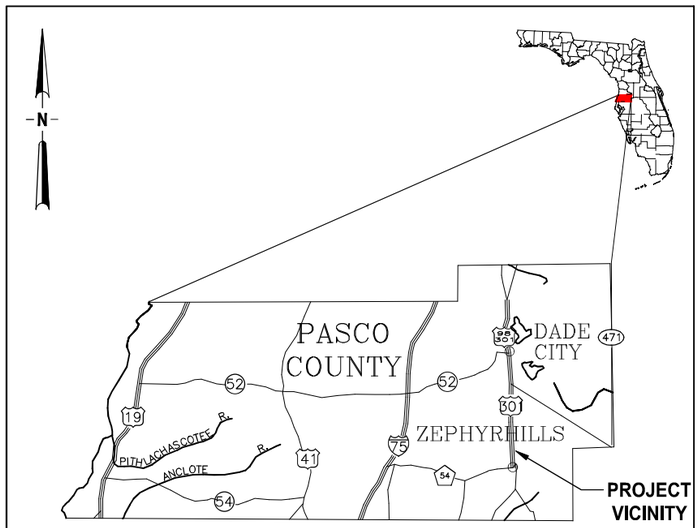
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JONES EDMUNDS
8657 BAYPINE ROAD, SUITE 300
JACKSONVILLE, FL 32256
E.O.R.: KENNETH ACIE FRASER, P.E., No. 57452

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING DIVISIONS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.:
GENERAL, CIVIL, EROSION CONTROL

KENNETH ACIE FRASER — LICENSE — No. 57452 — STATE OF FLORIDA — PROFESSIONAL ENGINEER

PREPARED FOR:



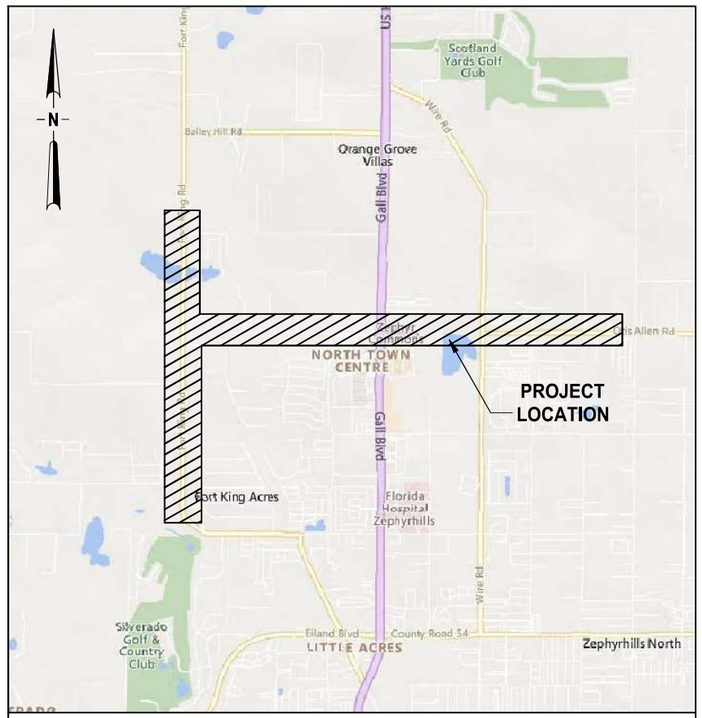
SITE VICINITY MAP

Zephyrhills Utilities Department

PREPARED BY:

JonesEdmunds

730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
324 S. HYDE PARK AVE., SUITE 250 TAMPA, FLORIDA 33606 / (813) 258-0703



PROJECT LOCATION

PROJECT # 26110-053-01

NOVEMBER 2023

BID DOCUMENTS

LAST SAVED: 11/8/2023 11:09 AMBY:KVIRGILIO PLOTTED:11/8/2023 11:10 AMBY:KEYLA VIRGILIO, EI

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GENERAL NOTES

REFERENCED DATA

1. TOPOGRAPHIC SURVEY PERFORMED BY DC JOHNSON AND ASSOCIATES, 11911 SOUTH CURLEY ST. SAN ANTONIO, FL 33576 A LICENSED PROFESSIONAL LAND SURVEYOR, DATED 3/09/2023.

2. THE SURVEY INFORMATION CONTAINED HEREIN WAS OBTAINED FOR DESIGN PURPOSES AND MAY NOT BE AN ADEQUATE REPRESENTATION OF ACTUAL CONDITIONS FOR PROJECT CONSTRUCTION. ANY EXISTING CONTOURS SHOWN REPRESENT INTERPOLATIONS/EXTRAPOLATIONS FROM THE BEST AVAILABLE SURVEY DATA. ALL RISKS RESULTING FROM THE USE OR INTERPRETATION OF THE SURVEY DATA SHOWN SHALL BE BORNE BY THE CONTRACTOR.

GENERAL

3. THE CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS AND REQUIREMENTS OF ALL PERMITS (FDEP, FDOT, PASCO COUNTY BUILDING DEPARTMENT, ETC) OBTAINED FOR THIS PROJECT.

4. THE CONTRACTOR IS ADVISED NOT TO SCALE FROM DRAWINGS BUT TO FIELD VERIFY ALL DIMENSIONS. THE DIMENSIONS OF SPECIFIED AND FURNISHED PRODUCTS AND MATERIALS TAKE PRECEDENCE OVER DIMENSIONS INDICATED ON THE DRAWINGS. IF SIGNIFICANT DEVIATIONS OCCUR, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 72 HOURS PRIOR TO CONSTRUCTION FOR A DETERMINATION AND RESOLUTION.

5. THE CONTRACTOR SHALL VERIFY THAT ALL CLEARANCES CAN BE MET. IF ANY CLEARANCES CANNOT BE MET, THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IN WRITING A MINIMUM OF 15 WORKING DAYS PRIOR TO CONSTRUCTING AND SUCH ITEM.

CONSTRUCTION LAYOUT/LIMITS OF CONSTRUCTION

6. THE CONTRACTOR SHALL OBTAIN THE SERVICES OF A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF FLORIDA FOR LAYOUT AND ESTABLISHMENT OF ELEVATIONS OF NEW WORK. PROOF OF LICENSE SHALL BE SUBMITTED TO THE ENGINEER BEFORE BEGINNING LAYOUT.

7. NO DISTURBANCE SHALL BE ALLOWED OUTSIDE OF THE RIGHT OF WAYS AND/OR THE LIMITS OF CONSTRUCTION SHOWN ON THE DRAWINGS UNLESS APPROVED BY THE OWNER OR SPECIFICALLY NOTED ON THE DRAWINGS.

EXISTING CONDITIONS

8. LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES ARE SHOWN BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE DRAWINGS BUT ARE NOT PURPORTED TO BE ABSOLUTELY CORRECT. THERE MAY BE OTHER IMPROVEMENTS, UTILITIES, ETC. WHICH ARE WITHIN THE PROJECT AREA. CONTRACTOR SHALL VERIFY, PRIOR TO CONSTRUCTION, THE LOCATIONS, ELEVATIONS, DIMENSIONS, TYPES, AND CONDITIONS OF ALL EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (WHETHER OR NOT SHOWN ON THE DRAWINGS) AFFECTING THE WORK.

9. PRIOR TO SHOP DRAWING PREPARATION AND SUBMITTAL AND PURCHASE OF RELATED MATERIALS, THE CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITIES (LOCATION, SIZE, MATERIALS OF CONSTRUCTION, OUTSIDE DIAMETER, WALL THICKNESS, ROUNDNESS, ELEVATIONS, ETC.) TO WHICH CONNECTION(S) WILL BE MADE. CONTRACTOR SHALL INCLUDE FIELD MEASUREMENTS ON SHOP DRAWINGS.

10. THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IN WRITING IMMEDIATELY IF CONFLICTS BETWEEN THE DRAWINGS AND ACTUAL CONDITIONS ARE DISCOVERED. THE CONTRACTOR SHALL ACCURATELY RECORD ANY SUCH CONFLICTS ON THE RECORD DRAWINGS.

11. ANY PROPERTY CORNERS, MONUMENTS, OR BENCH MARKS WITHIN THE PROJECT AREA SHALL BE PROTECTED UNLESS OTHERWISE INDICATED FOR DEMOLITION. IF ANY SUCH ITEMS ARE IN DANGER OF DAMAGE OR HAVE BEEN DAMAGED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER IMMEDIATELY AND REPLACE/RESTORE THESE ITEMS AT NO ADDITIONAL COST TO THE OWNER. IF OWNER CHOOSES TO SELF PERFORM THE WORK OR INCURS RELATED EXPENSES, THE CONTRACTOR SHALL REIMBURSE THE OWNER FOR ALL COSTS ASSOCIATED WITH THE EFFORT.

UTILITY COORDINATION

12. THE CONTRACTOR SHALL NOTIFY ALL UTILITIES NEAR THE PROJECT AREA AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE NOTIFYING "SUNSHINE 811 CALL OF FLORIDA" AT LEAST 48 HOURS PRIOR TO ANY DIGGING WORK TO HAVE ALL EXISTING UTILITIES LOCATED. THE PHONE NUMBER IS 1-800-432-4770 AND THE WEB SITE IS WWW.SUNSHINE811.COM, IN INSTANCES WHERE DIGGING OCCURS IN WETLANDS, THE NOTIFICATION PERIOD SHALL BE INCREASED FROM AT LEAST 48 HOURS TO AT LEAST 10 DAYS.

13. FLORIDA LAW (FS 553.851) REQUIRES THAT PERSONS MAKING EXCAVATIONS IN PUBLIC STREETS, ALLEYS, RIGHT-OF-WAYS OR UTILITY EASEMENTS MUST FIRST OBTAIN INFORMATION ON LOCATIONS OF UNDERGROUND GAS PIPELINES.

14. THE CONTRACTOR SHALL PRESERVE AND MAINTAIN EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES WITHIN THE PROJECT AREA. ANY DAMAGE SHALL BE REPAIRED BY AND AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.

15. THE CONTRACTOR IS RESPONSIBLE FOR BRACING, SHORING, OR PROVIDING OTHER MEANS NECESSARY TO PROTECT AND SUPPORT EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (EXPOSED OR UNEXPOSED) THAT MAY BE IMPACTED BY THE CONTRACTOR'S WORK.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING POWER/TELEPHONE COMPANIES AND ARRANGING TO HAVE UTILITIES POLES HELD AND/OR GUY WIRES REMOVED AND REPLACED, IF NECESSARY FOR CONSTRUCTION, AT NO ADDITIONAL COST TO THE OWNER.

SAFETY

17. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE FAMILIAR WITH THE OSHA EXCAVATION SAFETY STANDARDS AND TO ABIDE BY THEM AS COVERED UNDER THE FLORIDA TRENCH SAFETY ACT.

18. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION SAFETY.

RESTORATION

19. ALL PAVING, STABILIZED EARTH, DRIVEWAYS, CURBS, SIDEWALKS, FENCES, SOD, LANDSCAPING, CULVERTS, ETC. DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE RESTORED BY AND AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.

ACCESS/MAINTENANCE OF FACILITIES

20. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL EXISTING UTILITIES/FACILITIES AND MAINTAIN UNINTERRUPTED SERVICES THROUGHOUT THE CONTRACT PERIOD.

PIPING NOTES

21. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS. CONTRACTOR SHALL TAKE CARE TO PROVIDE PROPER GRADE ELEVATIONS AND ALIGNMENTS.

22. SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE. TYPE OF JOINT AND FITTING MATERIAL SHALL BE AS SPECIFIED FOR THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE.

23. CONTRACTOR SHALL CONSTRUCT NEW BELOW GRADE PIPING WITH A MINIMUM COVER OF 36". IF A MINIMUM COVER OF 36" CANNOT BE ACHIEVED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING.

24. CONTRACTOR SHALL INSTALL MINIMUM OF 1/4" THICK NEOPRENE PADDING BETWEEN PIPE AND SUPPORTS FOR DUCTILE IRON PIPE AND PIPE WITH COATINGS.

UTILITY SEPARATION

25. EACH PROPOSED UTILITY SHALL BE LAID TO ACHIEVE THE MINIMUM HORIZONTAL SEPARATION BETWEEN IT AND OTHER UTILITIES IN ACCORDANCE WITH THE TYPICAL UTILITY HORIZONTAL SEPARATION DETAIL AND FDEP REQUIREMENTS.

26. AT LOCATIONS WHERE A PROPOSED UTILITY CROSSES ANOTHER UTILITY, THE PROPOSED UTILITY SHALL BE INSTALLED IN ACCORDANCE WITH THE TYPICAL UTILITY CONFLICT DETAIL AND FDEP REQUIREMENTS.

27. IN THE EVENT THAT A UTILITY CONFLICT CAN NOT BE RESOLVED BY MAKING A MINOR ROUTE ADJUSTMENT OR BY UTILIZING THE TYPICAL UTILITY CONFLICT DETAIL, THE CONTRACTOR SHALL SUBMIT A RELOCATION PLAN TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCING WORK. ALL RELOCATION EFFORTS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER AND ANY AFFECTED UTILITY COMPANIES.

PROJECT SPECIFIC

28. ALL UTILITIES SHALL BE KEPT IN OPERATION EXCEPT WITH THE WRITTEN CONSENT OF THE UTILITY OWNER.

29. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING EXISTING UTILITIES AND PAVEMENT THAT THE CONTRACTOR DAMAGES DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER. REPAIRS SHALL BE CONDUCTED UNDER THE SUPERVISION OF THE OWNER AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND THESE DRAWINGS.

30. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF TWO WEEKS NOTICE TO THE OWNER PRIOR TO CONNECTING THE NEW CONSTRUCTION, EQUIPMENT, AND PIPING TO THE CITY OF ZEPHYRHILLS WWTF. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND SCHEDULING EACH CONNECTION WITH THE OWNER TO ENSURE THAT THERE ARE MINIMAL INTERRUPTIONS TO EACH SYSTEM.

31. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AND STABILIZING POWER POLES DURING CONSTRUCTION. THE CONTRACTOR SHALL CONTACT THE ELECTRIC UTILITY PROVIDER AND COORDINATE WITH THEM.

32. CONTRACTOR SHALL REMOVE TREE(S) WHEN IN DIRECT CONFLICT W/ PROPOSED WORK, AS APPROVED BY THE ENGINEER. CONTRACTOR SHALL OBTAIN PERMIT(S) REQUIRED.

33. PLEASE NOTE EXISTING UTILITIES AS SHOWN IN THE DRAWINGS ARE BASED ON GIS DATA. CONTRACTOR SHALL VERIFY EXISTING UTILITIES LOCATIONS PRIOR TO CONSTRUCTION.

SPECIAL REQUIREMENTS TO HAND-DIG EXCAVATIONS FOR EXISTING UTILITY COORDINATION

34. PLEASE NOTE AREAS OF EXISTING UTILITIES IN CLOSE PROXIMITY TO THE PROPOSED INSTALLATION HAVE BEEN NOTED WITH DASHED RECTANGULAR BOXES SHOWN IN THE PLANS.

35. IN THE NOTED AREAS AND OTHER AREAS IDENTIFIED DURING CONSTRUCTION, THE CONTRACTOR SHALL HAND DIG ALL EXCAVATIONS WITHIN 10 FEET IN ALL DIRECTIONS OF A MARKED LOCATED UTILITY LINE.

36. THE CONTRACTOR SHALL ALSO HAND DIG A PILOT TRENCH WHEN CALLED FOR ON THE DIG PERMIT FOR ALL UNDERGROUND UTILITY WORK ALONG THE CENTERLINE OF NEW TRENCHES AND DOWN TO THE BOTTOM ELEVATION OF THE NEW UTILITY.

37. MACHINE EXCAVATION SHALL PROCEED ONLY AFTER IT IS DETERMINED THAT ALL EXISTING UTILITIES HAVE BEEN IDENTIFIED AND PROTECTED.

HORIZONTAL DIRECTIONAL DRILL NOTES

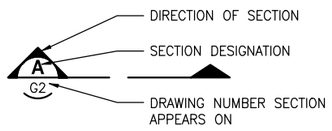
38. BORING LAYOUT BASED ON MINIMUM RADIUS OF 400 FEET. MAXIMUM BACK REAMER DIAMETERS SHALL BE
    13.6-INCH FOR 8-INCH DR-11 HDPE PIPE
    10.4-INCH FOR 6-INCH DR-11 HDPE PIPE

39. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNERS FOR ACCESS DURING UTILITY INSTALLATION.

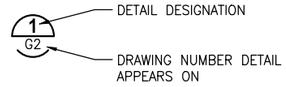
40. BORE DEPTH ON BORES BENEATH FDOT ROADWAY PAVEMENT SHALL BE 10X THE BACK REAMER SIZE PER UAM 3.16.9.1.

DRAWING INDEX

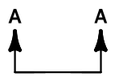
Sheet Number	Sheet Title
GENERAL	
G1	COVER SHEET
G2	DRAWING INDEX, GENERAL NOTES AND DESIGNATION
G3	ABBREVIATIONS
G4	LEGENDS AND PIPE SCHEDULE
G5	SURVEY LEGEND AND NOTES
G6	KEY MAP
CIVIL	
C1	FORT KING RD PLANVIEW
C2	FORT KING RD PLANVIEW
C3	FORT KING RD PLANVIEW
C4	FORT KING RD PLANVIEW
C5	KOSSIK RD PLANVIEW
C6	KOSSIK RD PLANVIEW
C7	KOSSIK RD PLANVIEW
C8	KOSSIK RD PLANVIEW
C9	OTIS ALLEN RD PLANVIEW
C10	OTIS ALLEN RD PLANVIEW
C11	HDD PROFILES
C12	HDD PROFILES
C13	HDD PROFILES
CIVIL DETAILS	
C14	CIVIL DETAILS
C15	CIVIL DETAILS
C16	CIVIL DETAILS
C17	CIVIL DETAILS
C18	CIVIL DETAILS
C19	CIVIL DETAILS
EROSION CONTROL	
EC1	STORMWATER POLLUTION PREVENTION DETAILS
EC2	STORMWATER POLLUTION PREVENTION DETAILS
EC3	STORMWATER POLLUTION PREVENTION DETAILS



SECTION DESIGNATION



DETAIL DESIGNATION



INDICATES ONE OR MORE SECTIONS CUT SHOWN ON THE SAME DETAIL

SECTION DESIGNATION

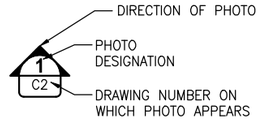


PHOTO DESIGNATION

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

DRAWING INDEX, GENERAL NOTES AND DESIGNATION

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH A. FRASER, PE #57452 ON THE DATE SHOWN ON THE COVER SHEET.

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PROJECT NO: 26110-053-01
DATE: NOV. 2023
INDEX NO:
DWG NO: G2

SAVED: 10/25/2023 10:25 AM SSIMS Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\053-01 NORTH SIDE LS PHASE 3\DESIGN&CONSTRUCTION\CAD\DWGS\GENERAL\26110053O1-G02.DWG

PLOTTED: 11/8/2023 11:10:25 AM KEYLA VIRGILIO, EI

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STANDARD ABBREVIATIONS

&	AND
@	AT
A	AUTOMATIC
AA STD	ALUMINUM ASSOCIATION STANDARD
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AB	ALIGNMENT BEGINNING
AC	ASBESTOS CEMENT
AC	ALTERNATING CURRENT
AC	AIR CONDITIONER
ACI	AMERICAN CONCRETE INSTITUTE
ADJ	ADJUSTABLE
AE	ALIGNMENT END
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIP	ABANDONED IN PLACE
AISI	AMERICAN IRON STEEL INSTITUTE
AIT	ANALYTICAL INDICATING TRANSMITTER
ALT	ALTERNATIVE
ALUM	ALUMINUM
AM	AUTO–MANUAL
AMPS	AMPERES
ANSI	AMERICAN NATION STANDARDS INSTITUTE
AP	ANALYZER PANEL
APP	APPROVE, APPROVED
APPROX	APPROXIMATE
AR	AIR RELEASE
ARV	AIR RELEASE VALVE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASD	ADJUSTABLE SPEED DRIVE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AVE	AVENUE
AWG	AMERICAN WIRE GUAGE
AWS	AMERICAN WELDING SOCIETY
AWWA	AMERICAN WATER WORKS ASSOCIATION
B	BORING
B/	BOTTOM OF
B/L	BASELINE OF CONSTRUCTION
BC	BARE COPPER
BF	BLIND FLANGE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BKR	BREAKER
BLD	BLIND
BLDG	BUILDING
BLVD	BOULEVARD
BM	BENCH MARK
BMP	BEST MANAGEMENT PRACTICE
BO	BLOW–OFF
BTM	BOTTOM
BTM/	BOTTOM OF
BV	BALL VALVE
BYP	BYPASS
C	CONDUIT, CONDUCTOR, CLOSE
C/L, CL	CENTERLINE
CAM	COMPUTER–AUTO–MANUAL
CAT	CATALOGUE
CB	CIRCUIT BREAKER
CC	CENTER TO CENTER
CCS	CENTRAL CONTROL SYSTEM
CF	COLUMN FOUNDATION
CFWE	CABLE FURNISHED WITH EQUIPMENT
CI	CAST IRON
CIP	CAST IN PLACE, CAST IRON PIPE
CISP	CAST IRON SLIP PIECE
CJ	CONSTRUCTION/CONTRACTION JOINT
CLF	CHAIN LINK FENCE
CLR	CLEAR
CM	COMPUTER–MANUAL
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
CO	COMPANY
COL	COLUMN
COM	COMMUNICATION
CON	CONCENTRIC
CONC	CONCRETE
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CORP	CORPORATION
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CRE	CORROSION RESISTANT
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
CS	CARBON STEEL
CT	CURRENT TRANSFORMER, CABLE TRAY CONTACTOR
CTRD	CENTERED
CV	CHECK VALVE
D	DRAIN
DB	DUCT BANK
DBI	DITCH BOTTOM INLET
DC	DIRECT CURRENT
DES	DESIGNATION
DET	DETAIL
DI	DUCTILE IRON
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DIPS	DUCTILE IRON PIPE SIZE
DIV	DIVISION
DN	DOWN, DAMPER
DR	DIMENSION RATIO
DWG	DRAWING
DXS	DOUBLE EXTRA STRONG
E	EAST(ING)
EA	EACH
ECC	ECCENTRIC
EES	EMERGENCY EYEWASH AND SHOWER
EF	EACH FACE, EXHAUST FAN
EG	SUCH AS
EJ	EXPANSION JOINT
EL, ELEV	ELEVATION
ELB	ELBOW
ELEC	ELECTRICAL
EOP	EDGE OF PAVEMENT
EQ	EQUAL
ERCP	ELLIPTICAL REINFORCED CONCRETE PIPE
EST	ELEVATED STORAGE TANK
ETC	ETCETERA
EW	EACH WAY
EXIST	EXISTING
FBC	FLORIDA BUILDING CODE
F, FU	FUSE
F/F	FINISHED FLOOR
FAB	FABRICATED
FAC	FLORIDA ADMINISTRATIVE CODE
FCA	FLANGED COUPLING ADAPTER
FCV	FLOW CONTROL VALVE
FDEP	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
FDN	FOUNDATION
FDOT	FLORIDA DEPARTMENT OF TRANSPORTATION
FDR	FEEDER
FE	FLOW ELEMENT
FF	FINISHED FLOOR
FFE	FINISHED FLOOR ELEVATION
FG	FINISHED GRADE, FIBERGLASS
FH	FIRE HYDRANT
FIG	FIGURE
FIN	FINISHED
FIT	FLOW INDICATING TRANSMITTER
FJ	FLANGED JOINT
FL	FLOOR
FLEX	FLEXIBLE
FLG	FLANGE(D)
FND	FOUNDATION
FNPT	FEMALE NATIONAL PIPE THREAD
FO	FIBER OPTIC
FOS	FAST–OFF–SLOW
FOSA	FAST–OFF–SLOW–AUTO
FOSR	FAST–OFF–SLOW–REMOTE
FP	FULL PENETRATION, FIELD PANEL
FR	FORWARD–REVERSE
FREQ	FREQUENCY
FRP	FIBER REINFORCED PLASTIC
FS	FLORIDA STATUTES, FAR SIDE, FLOW SWITCH
FT	FOOT
G	GROUND
GAL	GALLON
GALV	GALVANIZED
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERUPTER
GND	GROUND
GPM	GALLONS PER MINUTE
GR	GRADE
GRTG	GRATING
GS	GALVANIZED STEEL
GSP	GALVANIZED STEEL PIPE
GST	GROUND STORAGE TANK
GV	GATE VALVE
H	HIGH
HA	HAND AUGER
HD	HAND
HDD	HORIZONTAL DIRECTIONAL DRILL
HDNS	HARDNESS
HDPE	HIGH DENSITY POLYETHYLENE
HHWL	HIGH HIGH WATER LEVEL
HK	HOOK
HOA	HAND–OFF–AUTO
HOR	HAND–OFF–REMOTE
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HR	HANDRAIL
HSP	HIGH SERVICE PUMP
HT	HEIGHT
HWL	HIGH WATER LEVEL
I&C	INSTRUMENTATION AND CONTROL
IC	INTERRUPTING CAPACITY
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
IF	INSULATED FLANGE
IJ	ISOLATION JOINT
INC	INCORPORATED
IPS	IRON PIPE SIZE
J, JB	JUNCTION BOX
JT	JOINT
KA	KILOAMPERES
KB	KNEE BRACE
KCMIL	THOUSAND CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT AMPERES
KW	KILOWATTS
KWH	KILOWATT HOUR
L	LOWER
LB, LBS	POUND(S)
LE	LEVEL ELEMENT
LEL	LOWER EXPLOSIVE LIMIT
LF	LINEAR FEET
LG	LONG
LIT	LEVEL INDICATING TRANSMITTER
LIU	LIGHT INTERFACE UNIT
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LLWL	LOW LOW WATER LEVEL
LOS	LOCKOUT STOP
LR	LONG RADIUS, LOCAL–REMOTE
LS	LIFT STATION
LSIG	LONG SHORT INSTANTANEOUS GROUND
LWL	LOW WATER LEVEL
M	MAGNETIC CONTACTOR COIL, MOTOR, MANUAL
M/F	MALE/FEMALE
MAX	MAXIMUM
MC	MODULATE–CLOSE
MCC	MOTOR CONTROL CENTER
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MES	MITERED END SECTION
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MNPT	MALE NATIONAL PIPE THREAD
MO	MOTOR OPERATOR
MP	METERING PUMP
MPH	MILES PER HOUR
MS	MOTOR STARTER
MSC	MANUFACTURER SUPPLIED CABLE
MT, MTD	MOUNT(ED)
MTL	METAL
MV	MEDIUM VOLTAGE
N	NORTH(ING), NEUTRAL, NORMAL
N/A	NOT APPLICABLE
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NC	NORMALLY CLOSED
NE	NORTH EAST
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NPT	NATIONAL PIPE THREAD
NPW	NON POTABLE WATER
NRS	NONRISING STEM
NS	NEAR SIDE
NSF	NATIONAL SANITATION FOUNDATION
NTS	NOT TO SCALE
NW	NORTH WEST
OC	ON CENTER(S), OPEN–CLOSE(D)
OCA	OPEN–CLOSE–AUTO
OCR	OPEN–CLOSE–REMOTE
OD	OUTSIDE DIAMETER
OF	OVERFLOW
OO	ON–OFF
OOA	ON–OFF–AUTO
OOR	ON–OFF–REMOTE
OPP	OPPOSITE
ORP	OXIDATION REDUCTION POTENTIAL
OS&Y	OUTSIDE STEM AND YOKE
OSC	OPEN–STOP–CLOSE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
P&ID	PIPING AND INSTRUMENTATION DIAGRAM
P/L	PROPERTY LINE
PB	PULL BOX
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PCV	PRESSURE CONTROL VALVE
PE	PLAIN END, POLYETHYLENE
PET	POLYETHYLENE TUBING
PF	POWER FACTOR
pH	HYDROGEN ION CONCENTRATION
PH	PHASE
PI	POINT OF INTERSECTION/PLANT INFLUENT
PID	PROPORTIONAL INTEGRAL DERIVATIVE
PIT	PRESSURE INDICATING TRANSMITTER
PIV	POST INDICATOR VALVE
PL	PLATE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PLCS	PLACES
POC	POINT OF CONNECTION
POE	POINT OF ENTRY
POJ	PUSH ON JOINT
PP	POWER POLE
PPE	PERSONAL PROTECTIVE EQUIPMENT
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSID	POUNDS PER SQUARE INCH DIFFERENTIAL
PSIG	POUNDS PER SQUARE INCH GAUGE
PSV	PRESSURE SUSTAINING VALVE
PT	PRESSURE TREATED, POTENTIAL TRANSFORMER
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PW	POTABLE WATER
PWR	POWER
R	RADIUS
R/W, ROW	RIGHT–OF–WAY
RCP	REINFORCED CONCRETE PIPE
RCPT	RECEPTACLE
RED	REDUCER
REF	REFERENCE
REINF	REINFORCEMENT, REINFORCING
REQ, REQ'D	REQUIRED
RGS	RIGID GALVANIZED STEEL
RJ	RESTRAINED JOINT
RM	REMOTE MULTIPLEXING MODULE
RMS	ROOT MEAN SQUARE
RPZ	REDUCED PRESSURE ZONE
RT	RIGHT
RTU	REMOTE TELEMETRY UNIT
SARV	SURGE ANTICIPATOR RELIEF VALVE
SBC	STANDARD BUILDING CODE
SCH	SCHEDULE
SCJ	SAW CUT JOINT
SDI	STEEL DECK INSTITUTE
SE	SOUTH EAST
SEC	SECOND
SF	SLOWER–FASTER
SHEC	SHOULDERED–END COUPLING
SHT	SHEET
SIM	SIMILAR
SJI	STEEL JOINT INSTITUTE
SM	STATIC MIXER
SP	SPACING, SPACED
SPD	SURGE PROTECTIVE DEVICE
SQ	SQUARE
SR	STATE ROAD, SURGE RELIEF
SRV	SURGE RELIEF VALVE
SS	START–STOP
SS, SST	STAINLESS STEEL
SSC	SUPERVISORY SET POINT CONTROL
SSRV	SOLID STATE REDUCED VOLTAGE
ST	SHUNT TRIP
STA	STATION
STD	STANDARD
STL	STEEL
STS	STORMWATER SEWER
SW	SOUTH WEST, SWITCH
SWD	SIDE WATER DEPTH
SWJ	SOLVENT WELD JOINT
SWPPP	STORM WATER POLLUTION PREVENTION PLAN
SY	SQUARE YARD
T, THK	THICK
T/	TOP OF
T/B,T&B	TOP AND BOTTOM
TBM	TEMPORARY BENCHMARK
TEMP	TEMPERATURE
TGS	THREADED GALVANIZED STEEL
TGSP	THREADED GALVANIZED STEEL PIPE
TH	TOTAL HEAD
THERMO	THERMOSTATIC
THD	THREADED
TJB	TERMINAL JUNCTION BOX
TK	TANK
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TOSJ	TOP OF STEEL JOIST
TOW	TOP OF WALL
TS	TUBULAR STEEL
TSF	THICKENED SLAB FOOTING
TSP	TWISTED SHIELDED PAIR
TURB	TURBIDITY
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITER'S LABORATORIES
ULC	ULTRASONIC LEVEL CONTROLLER
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTAGE, VOLTS
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VH	VAPOR HEATER
VIB	VIBRATION
VIF	VERIFY IN FIELD
VP	VAPORIZER
W	WIDE, WATT
W/	WITH
W/O	WITHOUT
WCJ	WALL CONTROL JOINT
WF	WALL FOOTING
WGT	WEIGHT
WP	WORK POINT, WEATHERPROOF
WSE, WSEL	WATER SURFACE ELEVATION
WT	WEIGHT
WV	WATER VALVE
WWF	WELDED WIRE FABRIC
XFMR	TRANSFORMER
XS	EXTRA STRONG

CUSTOM ABBREVIATIONS

COZ	CITY OF ZEPHYRHILLS
SWFWMD	SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
ISO	ISOMETRIC
EOR	ENGINEER OR RECORD
WM	WATER MAIN
FM	FORCE MAIN

NOTES:
1. SEE LEGENDS AND PIPE SCHEDULE FOR ADDITIONAL ABBREVIATIONS.
2. NOT ALL ABBREVIATIONS MAY BE USED FOR THIS PROJECT.

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NORTHSIDE PHASE 3 FORCE MAIN \
WATER LINE EXTENSION

ABBREVIATIONS

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INDEX NO:	DWG NO: G3

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MECHANICAL LEGEND

CIVIL LEGEND

- CONTOURS (90)
- MATCHLINE
- RIGHT-OF-WAY BOUNDARY
- PROPERTY BOUNDARY
- EASEMENT BOUNDARY
- CENTERLINE
- WATERMAIN LINE (WM)
- FORCEMAIN LINE (FM)
- GAS LINE (G)
- ELECTRICAL LINE (E)
- CHLORINE LINE
- SILT FENCE (SF)
- TURBIDITY BARRIER (TB)
- DEMO HATCH
- WETLAND (WL)
- SPOT ELEVATION (+100.00)
- REINFORCED CONCRETE PIPE (RCP)
- TRENCH DRAIN
- MITERED END SECTION W/ STRUCTURE DESIGNATION (S-1)
- FLARED END SECTION W/ STRUCTURE DESIGNATION (S-1)
- DITCH BOTTOM INLET W/ STRUCTURE DESIGNATION (S-1)
- COORDINATE POINT
- PROPOSED SIGN
- CONCRETE
- LIMEROCK
- COMPACTED SOIL
- GRAVEL
- ASPHALT RESTORATION
- FORCEMAIN FLOW DIRECTION
- POTENTIAL UTILITY CONFLICT

PIPING SYMBOLS

DOUBLE LINE	SINGLE LINE	
		PIPE
		WELDED PIPE
		FLANGED JOINT
		MECHANICAL JOINT OR RESTRAINED PUSH-ON JOINT
		FLEXIBLE COUPLING ADAPTER
		EXPANSION JOINT
		HUB & SPIGOT JOINT
		BALL JOINT
		FLANGED COUPLING ADAPTER W/ THRUST TIES
		FLEXIBLE COUPLING WITH THRUST TIES
		BLIND FLANGE
		ELBOW UP
		ELBOW DOWN
		TEE UP
		TEE DOWN
		FEMALE QUICK DISCONNECT FITTING
		MALE QUICK DISCONNECT FITTING

DOUBLE LINE	SINGLE LINE	
		LATERAL UP
		LATERAL DOWN
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		UNION
		CAP
		ANCHOR
		WYE
		TEE
		CROSS
		ELBOW, 90 DEGREE
		ELBOW, 45 DEGREE
		ELBOW, 22.5 DEGREE
		ABANDON IN PLACE
		DEMOLISH AND REMOVE

VALVE SYMBOLS

- GATE
- BUTTERFLY
- BALL
- CHECK
- DIAPHRAGM
- NEEDLE
- PRESSURE RELIEF
- AIR RELEASE AND/OR VACUUM RELIEF
- REGULATED SIDE
- HYDRAULIC CONTROL VALVE

ACTUATOR SYMBOLS

- M XX — ELECTRIC MOTOR
- EH XX — ELECTROHYDRAULIC
- P XX — PNEUMATIC
- H XX — HYDRAULIC
- S — SOLENOID
- MANUAL

NOTE:

ON LOSS OF PRIMARY POWER
(PNEUMATIC, ELECTRICAL OR HYDRAULIC)
XX: FO = FAIL OPEN
FC = FAIL CLOSED
FLP = FAIL TO LAST POSITION

PIPE SUPPORT SYMBOLS

- U-SHAPED PIPE SUPPORT
- FLANGED PIPE SUPPORT
- PIPE SUPPORT W/ AXIAL LOAD SUPPORT

PIPE SCHEDULE NOTES:

GENERAL NOTES:
1. COAT BURIED AND SUBMERGED PIPE PER PIPE SPECIFICATIONS.
2. TEST LINES PER SECTION 15144 UNLESS NOTED OTHERWISE.
3. LABEL ALL PIPING PER SECTION 15075.

RESTRAINT SYSTEM NOTES:
(1) SEE RESTRAINT DETAILS C14

SPECIFIC NOTES:
(A) DISINFECT PIPING PER SECTION 15141.

PIPE SCHEDULE

ABBREVIATION	FLOW STREAM IDENTIFICATION	PIPE/DUCT MATERIAL	PIPE MATERIAL ABBREV	DIMENSION RATIO (DR)	SPECIFICATION NUMBER	PIPE LINING	NORMAL MAX OPERATING PRESSURE (PSIG)	FIELD TEST PRESSURE (PSIG)	EXPOSED PIPE PAINT SYSTEM	COLOR CODE	SPECIFIC NOTES	RESTRAINT SYSTEM NOTES
FM-1	FORCE MAIN	POLYVINYL CHLORIDE	PVC	18	15291	N/A		150	N/A	GREEN	N/A	(1)
FM-2	FORCE MAIN	HIGH DENSITY POLYETHYLENE	HDPE	11	15155	N/A		160	N/A	GREEN	N/A	(1)
WM-1	WATER MAIN	POLYVINYL CHLORIDE	PVC	18	15291	N/A		150	N/A	GREEN	N/A	(1)

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

LEGENDS AND PIPE SCHEDULE

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SURVEYOR'S NOTES:

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2. THIS SURVEY WAS PREPARED WITHOUT AN ABSTRACT OF TITLE; THEREFORE THE UNDERSIGNED MAKES NO GUARANTEES OR REPRESENTATIONS REGARDING INFORMATION SHOWN HEREON PERTAINING TO EASEMENTS, RIGHTS-OF-WAY, SETBACK LINES, AGREEMENTS, RESERVATIONS, OR OTHER SIMILAR MATTERS.

3. NO INSTRUMENTS OF RECORD REFLECTING EASEMENTS, RIGHT-OF-WAYS AND/OR OWNERSHIP WERE FURNISHED TO THE UNDERSIGNED EXCEPT AS SHOWN.

4. NO UNDERGROUND INSTALLATIONS, IMPROVEMENTS OR ENCROACHMENTS, HAVE BEEN LOCATED EXCEPT THOSE SHOWN HEREON.

5. ELEVATIONS SHOWN HEREON ARE BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), NATIONAL GEODETIC SURVEY BENCHMARK "V 662", LOCATED ALONG GALL BOULEVARD IN ZEPHYRHILLS, FL, PUBLISHED ELEVATION = 107.53' (NAVD88).

6. BEARINGS AND DISTANCES SHOWN HEREON ARE FIELD MEASURED, UNLESS OTHERWISE INDICATED.

7. THE TEXT FOR TIES TO IMPROVEMENTS INDICATES THE DIRECTION THEY LIE IN RELATION TO THE BOUNDARY.

8. SUBJECT PROPERTY MAY CONTAIN LANDS THAT ARE SUBJECT TO JURISDICTION OR RESTRICTION BY ONE OR MORE OF THE FOLLOWING AGENCIES: ARMY CORP. OF ENGINEERS, SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (S.W.F.W.M.D.) OR FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (F.D.E.P.).

SURVEYOR'S LEGEND

IP, IR = IRON PIPE, IRON ROD
R/W = RIGHT-OF-WAY
O.R. = OFFICIAL RECORDS BOOK
PG. = PAGE
EL. = ELEVATION
I.E. = INVERT ELEVATION
T.C. = TOP OF CURB
E.P. = EDGE OF PAVEMENT
PVC = POLY-VINYL CHLORIDE PIPE
RCP = REINFORCED CONCRETE PIPE
CMP = CORRUGATE METAL PIPE
HDPE = HIGH-DENSITY POLYETHYLENE PIPE
= SET 5/8" IR "DC JOHNSON LB 4514"
= SET NAIL & DISK "LB 4514"
= VERTICAL CONTROL BENCHMARK
= POWER POLE/TELEPHONE POLE
= LIGHT POLE
= GUY ANCHOR
= BOLLARD
= ROADSIGN
= REFLECTOR SIGN
= MAILBOX
= CLEANOUT
= CHAIN LINK FENCE
= VINYL FENCE
= WIRE FENCE
= WOOD FENCE
91.5 = SPOT ELEVATION
= CAMPHOR TREE (SIZE AS NOTED)
= CHERRY LAUREL TREE (SIZE AS NOTED)
= MAGNOLIA TREE (SIZE AS NOTED)
= OAK TREE (SIZE AS NOTED)
= PALM TREE (SIZE AS NOTED)
= PINE TREE (SIZE AS NOTED)

= TREE (UNKNOWN VARIETY)
= STORM MANHOLE
= SANITARY MANHOLE
= GATE VALVE - SANITARY
= AIR RELEASE VALVE - SANITARY
= WATER METER
= GATE VALVE - WATER
= AIR RELEASE VALVE - WATER
= WATER LINE WITNESS POST
= FIRE HYDRANT
= FIRE DEPARTMENT CONNECTION
= GATE VALVE - FIRE
= RECLAIMED WATER METER
= GATE VALVE - RECLAIMED
= BACKFLOW PREVENTER - RECLAIMED
= UTILITY VAULT/HAND HOLE
= GATE VALVE
= AIR RELEASE VALVE
= ELECTRIC METER
= ELECTRIC BOX
= ELECTRIC TRANSFORMER
OHP = OVERHEAD POWER LINE
= GAS VALVE
= GAS LINE WITNESS POST
= TELEPHONE EQUIPMENT BOX
= TELEPHONE PEDESTAL
= TELEPHONE LINE WITNESS POST
= FIBER OPTIC VAULT/HAND HOLE
= FIBER OPTIC WITNESS POST
= TRAFFIC SIGNAL POLE
= PEDESTRIAN SIGNAL POLE
TC = TRAFFIC CONTROL BOX
= TRAFFIC CONTROL VAULT/HAND HOLE
TC = TRAFFIC CONTROL LINE
= ASPHALT
= CONCRETE
= GRAVEL/DIRT ROAD

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

SURVEY LEGEND AND NOTES

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N

GRAPHIC SCALE

0 250 500 1000

SCALE IN FEET

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

KEY MAP

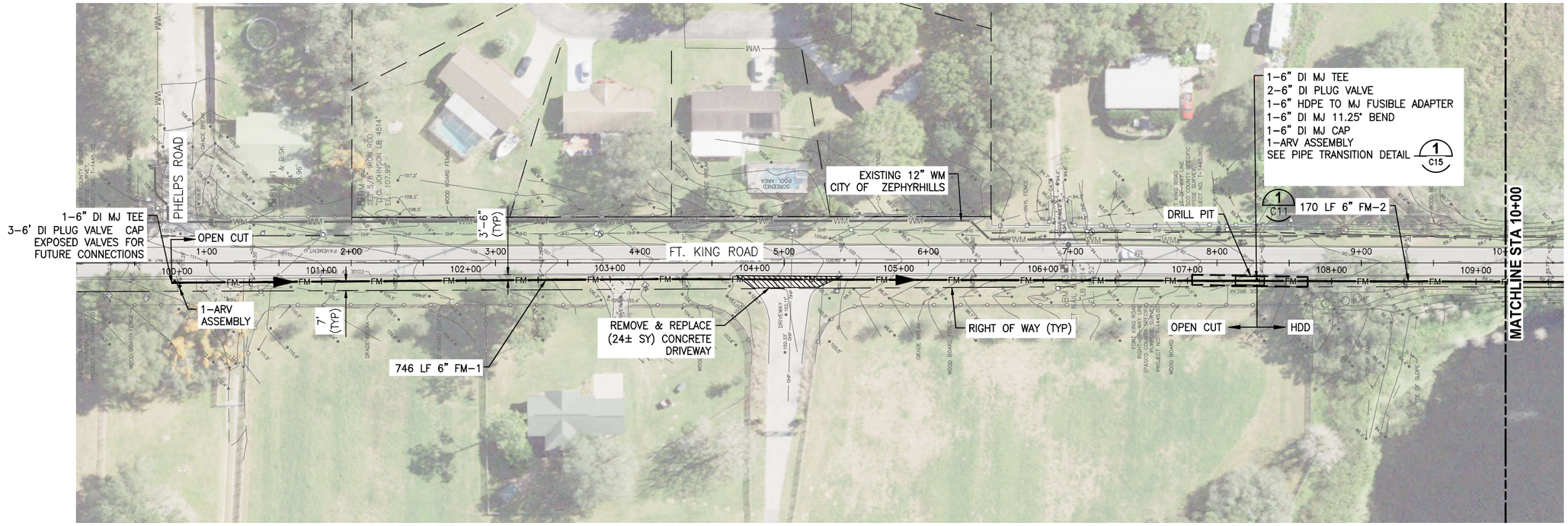
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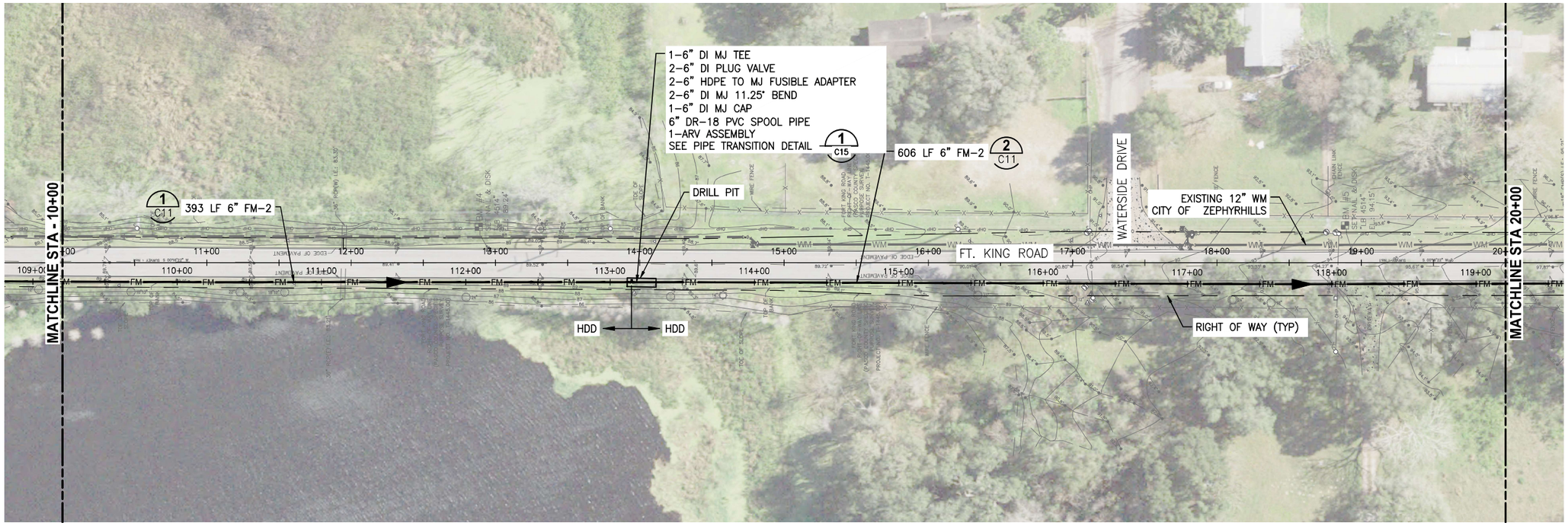
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GRAPHIC SCALE
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SCALE IN FEET

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NORTHSIDE PHASE 3 FORCE MAIN \
WATER LINE EXTENSION

FORT KING RD PLANVIEW

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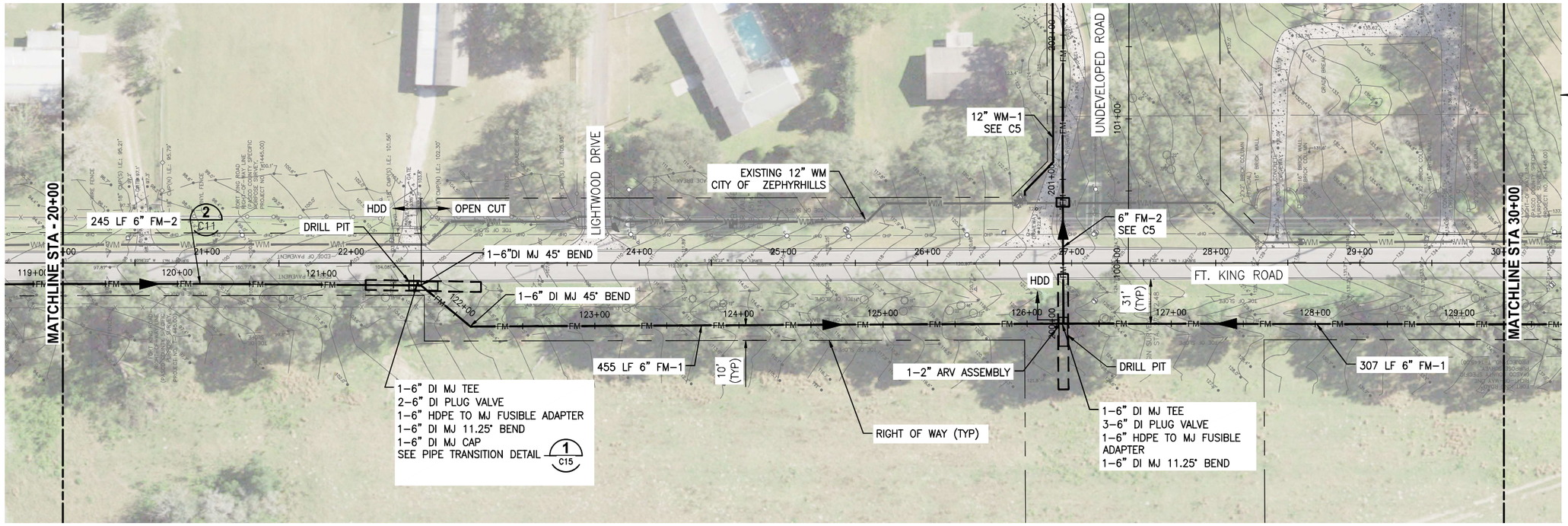
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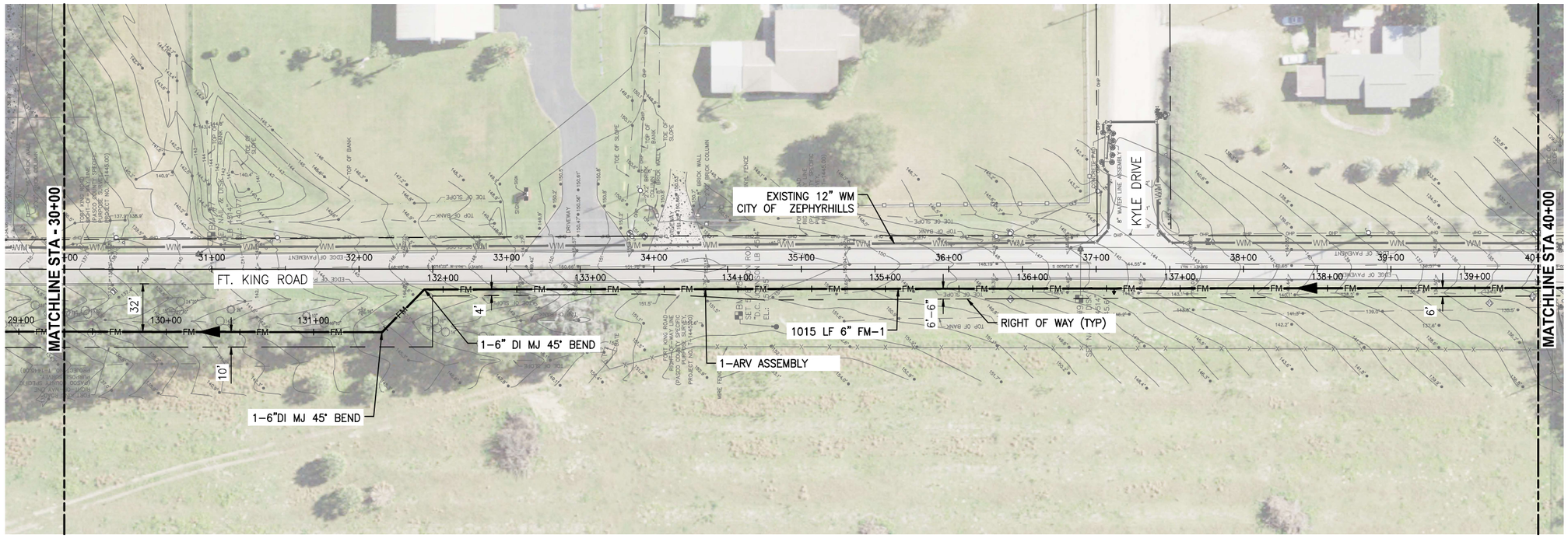
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NORTHSIDE PHASE 3 FORCE MAIN \
WATER LINE EXTENSION

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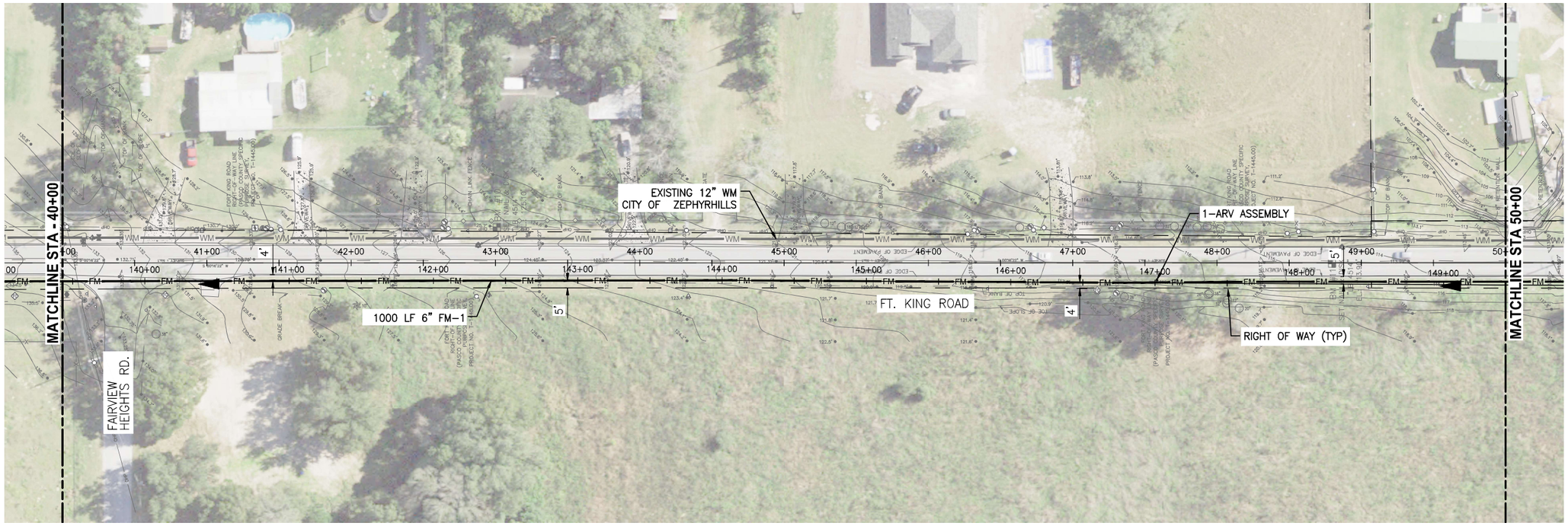
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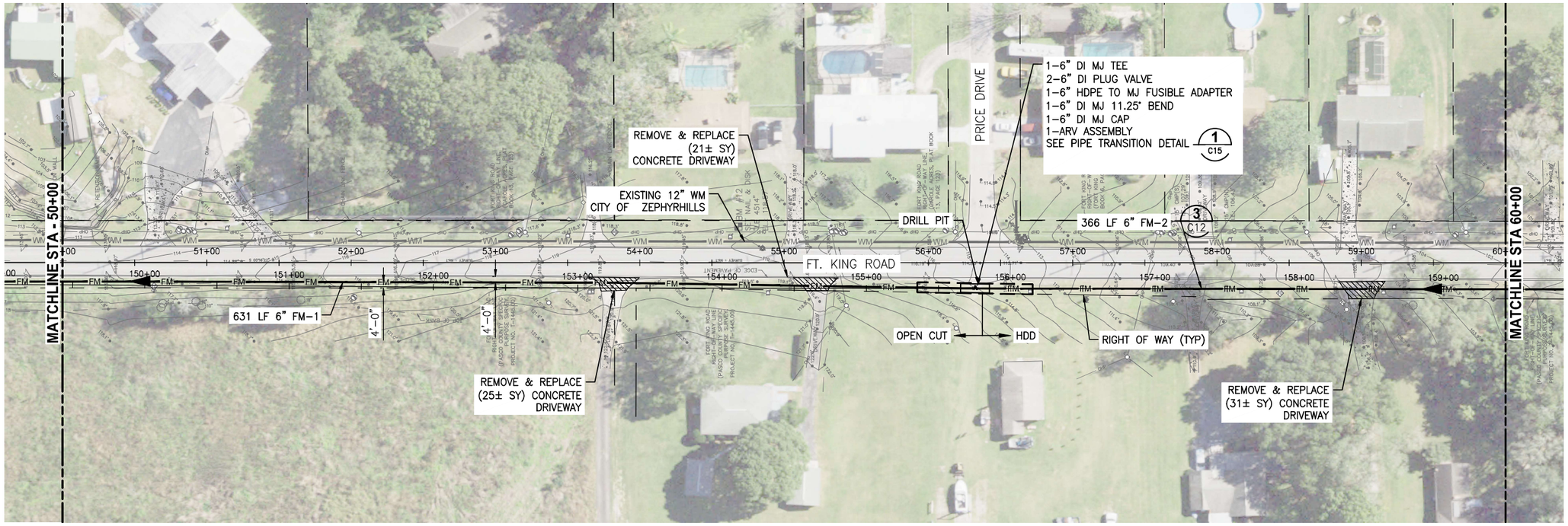
PROJECT NO: 26110-053-01
DATE: NOV. 2023
INDEX NO:
DWG NO: C2

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GRAPHIC SCALE
0 20 40 80
SCALE IN FEET

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8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \
WATER LINE EXTENSION

FORT KING RD PLANVIEW

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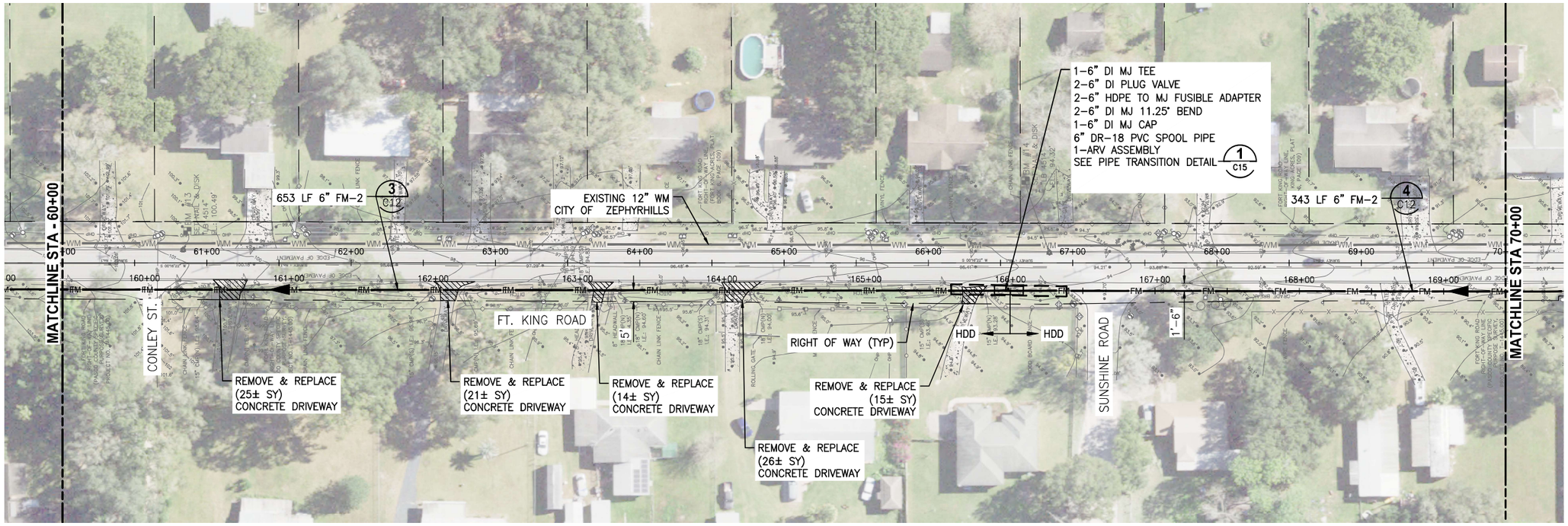
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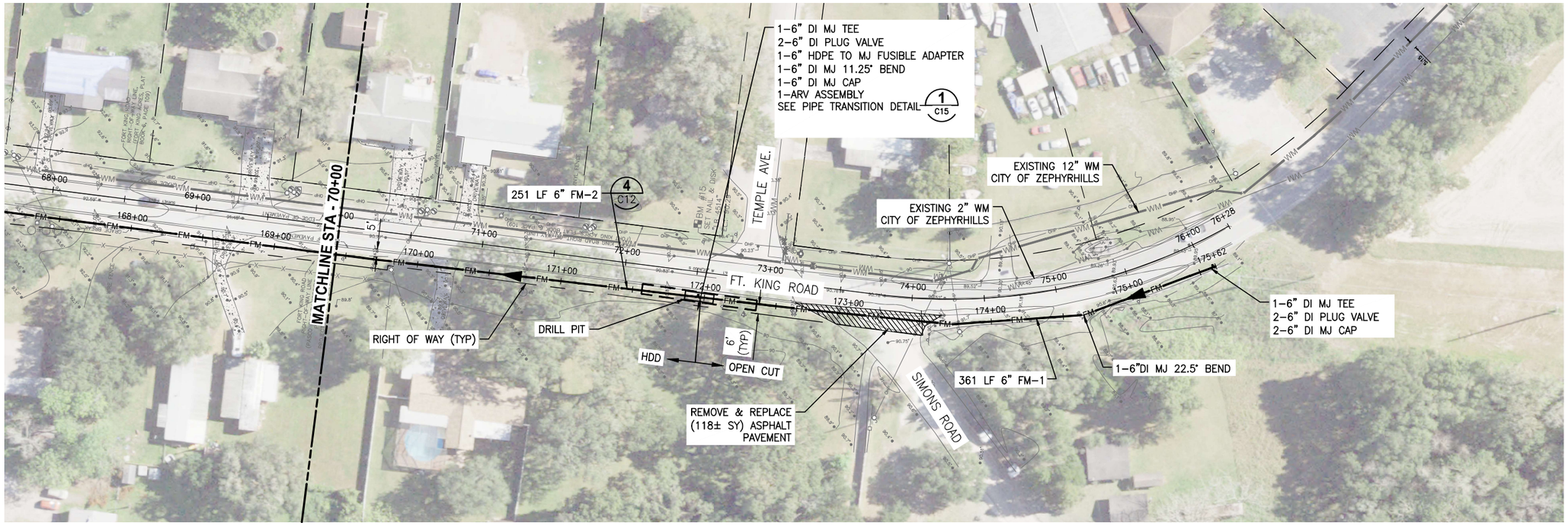
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INDEX NO:	DWG NO: C3

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

FORT KING RD PLANVIEW

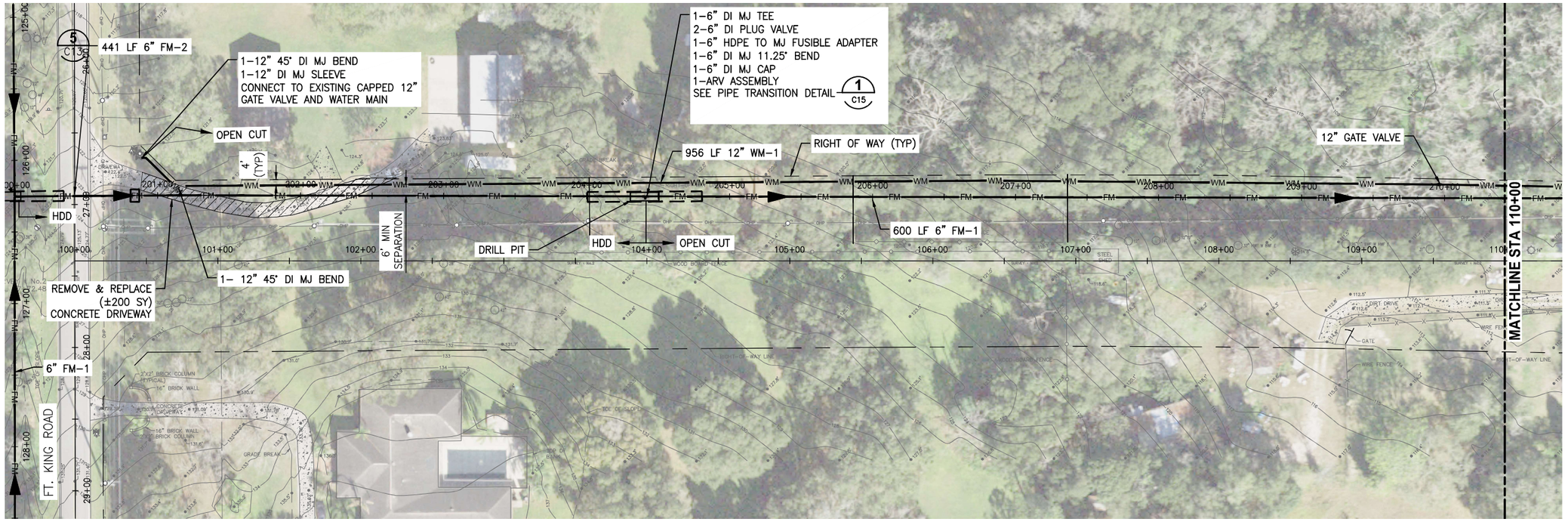
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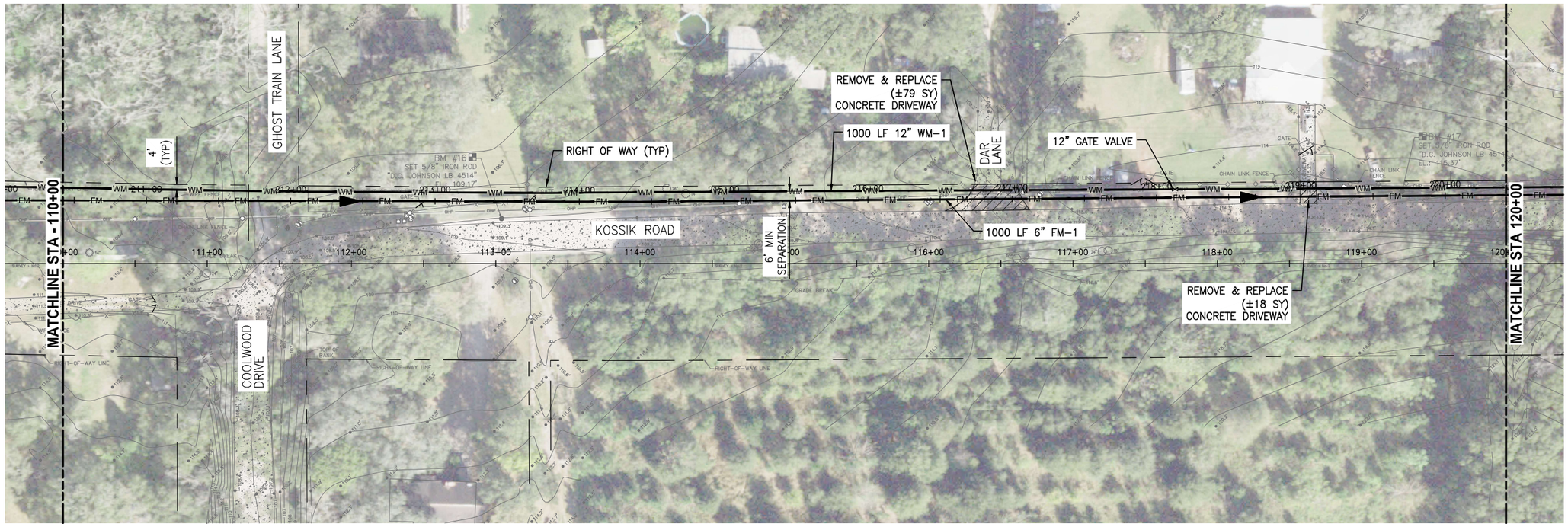
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PROJECT NO:	DATE:
26110-053-01	NOV. 2023
INDEX NO:	DWG NO: C4

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

KOSSIK RD PLANVIEW

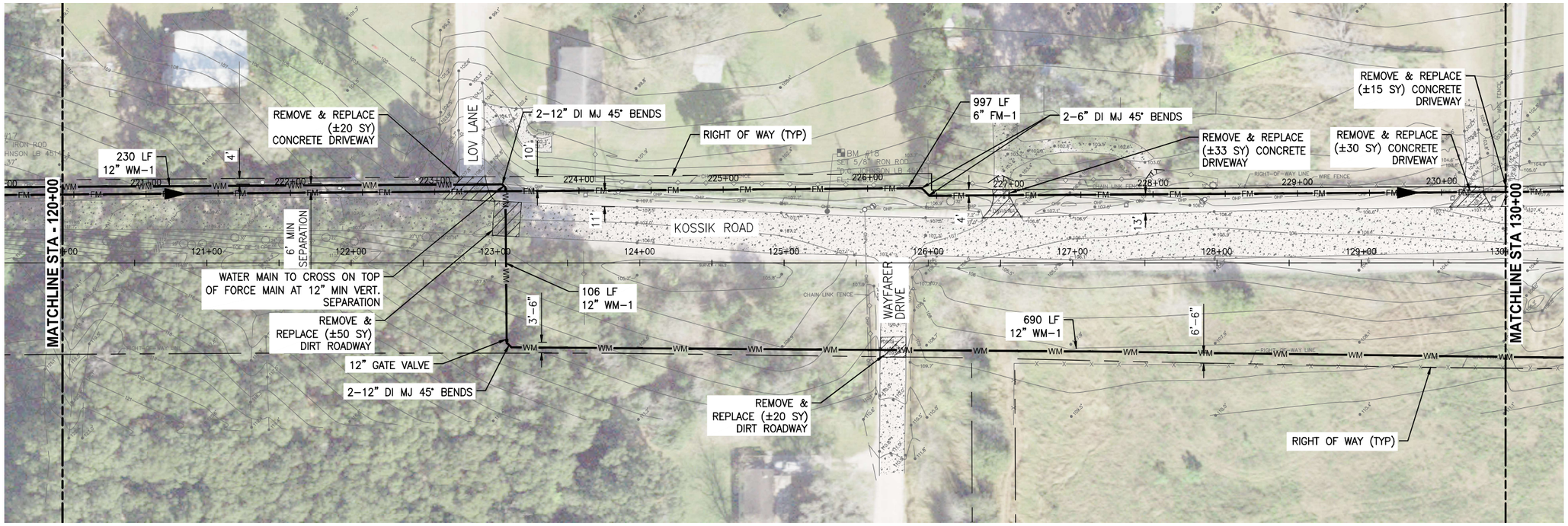
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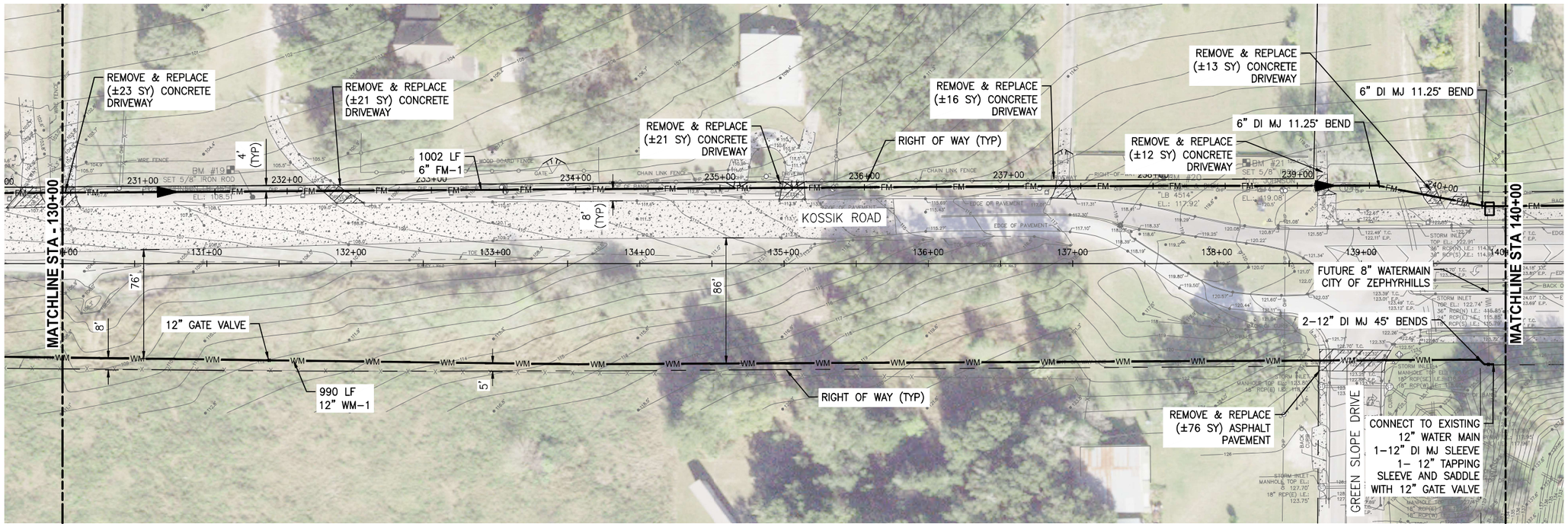
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PROJECT NO:	DATE:
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INDEX NO:	DWG NO: C5

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N

GRAPHIC SCALE
0 20 40 80
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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

KOSSIK RD PLANVIEW

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PROJECT NO:	DATE:
26110–053–01	NOV. 2023
INDEX NO:	DWG NO: C6

SAVED: 10/27/2023 3:06 PM KFRASER Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\053-01 NORTH SIDE LS PHASE 3\DESIGN&CONSTRUCTION\CAD\DWGS\CIVIL\26110053O1-C05.DWG

PLOTTED: 11/8/2023 11:21:46 AM KEYLA VIRGILIO, EI

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MATCHLINE STA - 140+00

998 LF
6" FM-1

15' (TYP)

RIGHT OF WAY (TYP)

8' (TYP)

1-ARV ASSEMBLY

MATCHLINE STA 150+00

BM #22
SET NAIL & DISK
EL: 129.2

KOSSIK ROAD

N

GRAPHIC SCALE
0 20 40 80
SCALE IN FEET

R = 38,197.19
P.C. STA. 451+58.03 (451+51.80)
P.T. STA. 470+76.98 (470+74.00)

1-6"x8" DI MJ REDUCER
1- 8" DI MJ SLEEVE
CONNECT TO EXISTING CAPPED
8" PLUG VALVE

EXISTING 8" FORCE MAIN
CITY OF ZEPHYRHILLS

EXISTING 8" WATER MAIN
CITY OF ZEPHYRHILLS

2-6" DI MJ
45° BENDS

193 LF
6" FM-1

REPLACE ASPHALT 10' IN EACH
DIRECTION OF THE DAMAGE, ENTIRE
WIDTH OF THE TRAIL. MATCH EXISTING.

1-8" DI MJ SLEEVE
CONNECT TO EXISTING CAPPED
8"PLUG VALVE AND TEE

REMOVE & REPLACE
(±647 SY)
CONCRETE SIDEWALK

RIGHT OF WAY (TYP)

485 LF 8" FM-1

8" DI MJ 11.25° BEND

5' (TYP)

9' (TYP)

OPEN CUT

6" DI MJ 45° BEND

6" DI MJ 45° BEND

EXISTING GAS MAIN
APPROXIMATE LOCATION

GALL BLVD

MATCHLINE STA - 150+00

MATCHLINE STA 160+00

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NORTHSIDE PHASE 3 FORCE MAIN \
WATER LINE EXTENSION

KOSSIK RD PLANVIEW

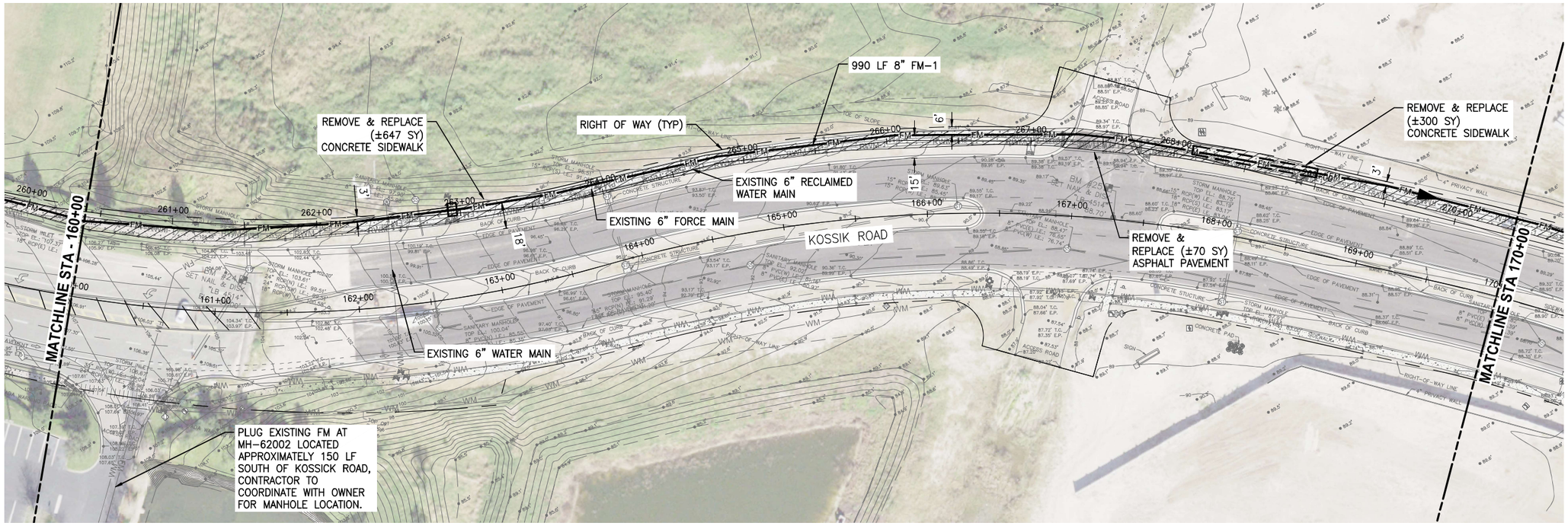
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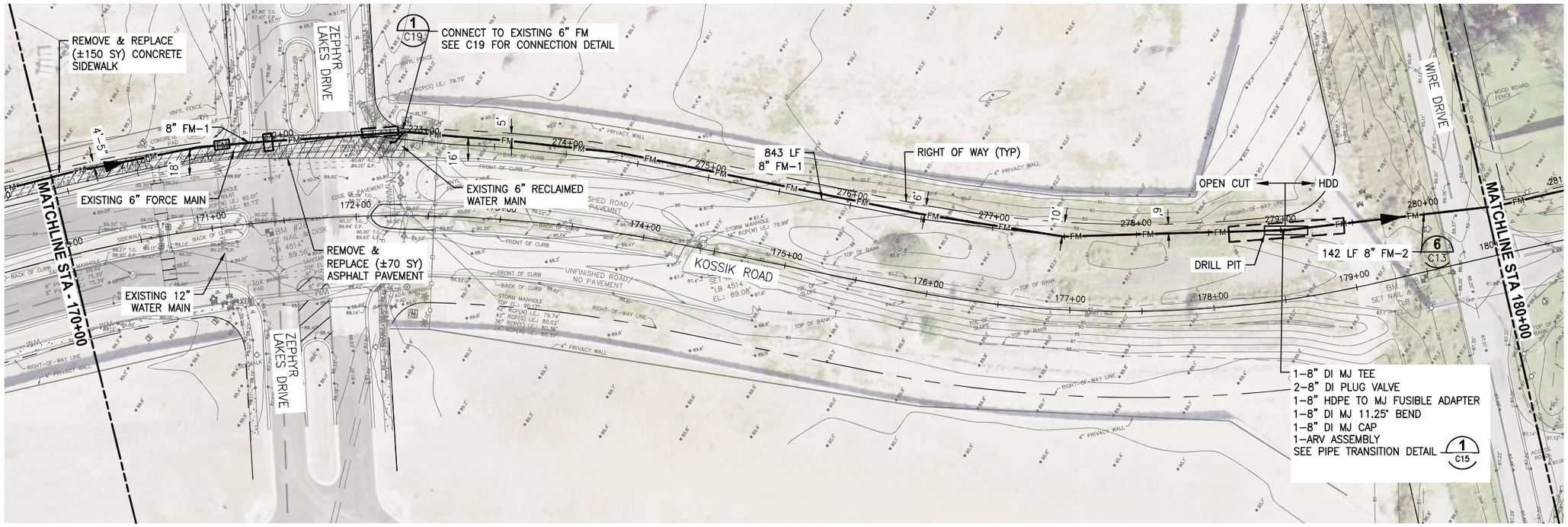
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PROJECT NO:	DATE:
26110-053-01	NOV. 2023
INDEX NO:	DWG NO: C7

SAVED: 10/27/2023 3:06 PM KFRASER Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\053-01 NORTH SIDE LS PHASE 3\DESIGN&CONSTRUCTION\CAD\DWGS\CIVIL\26110053O1-C05.DWG

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

KOSSIK RD PLANVIEW

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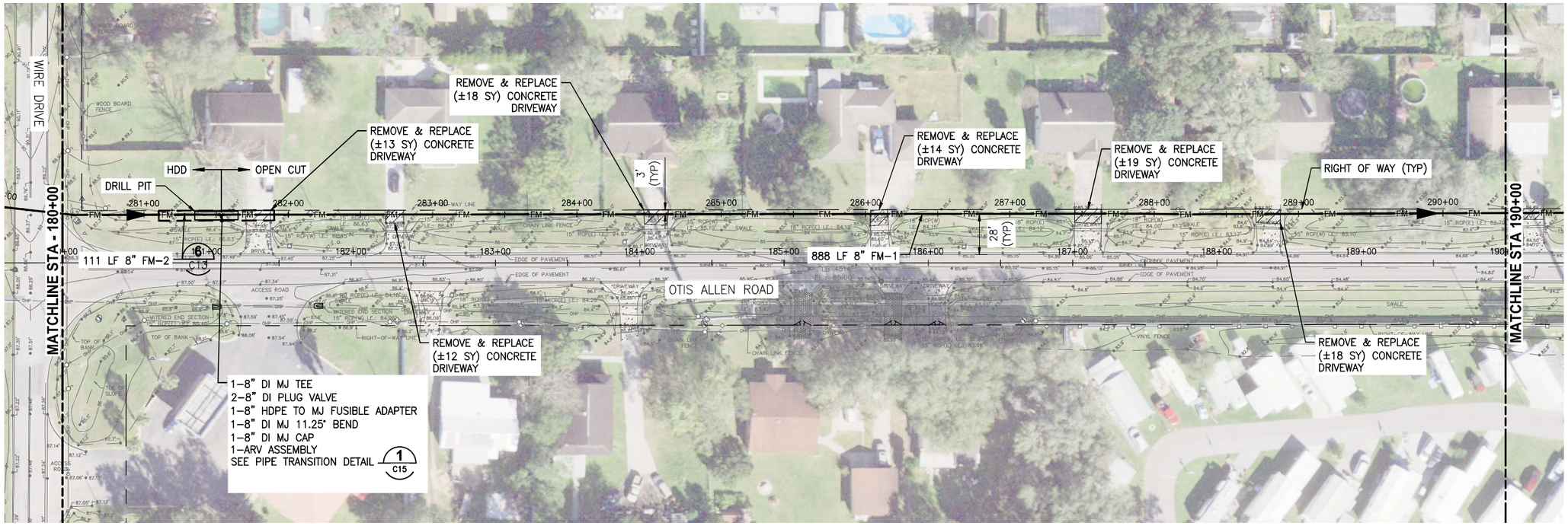
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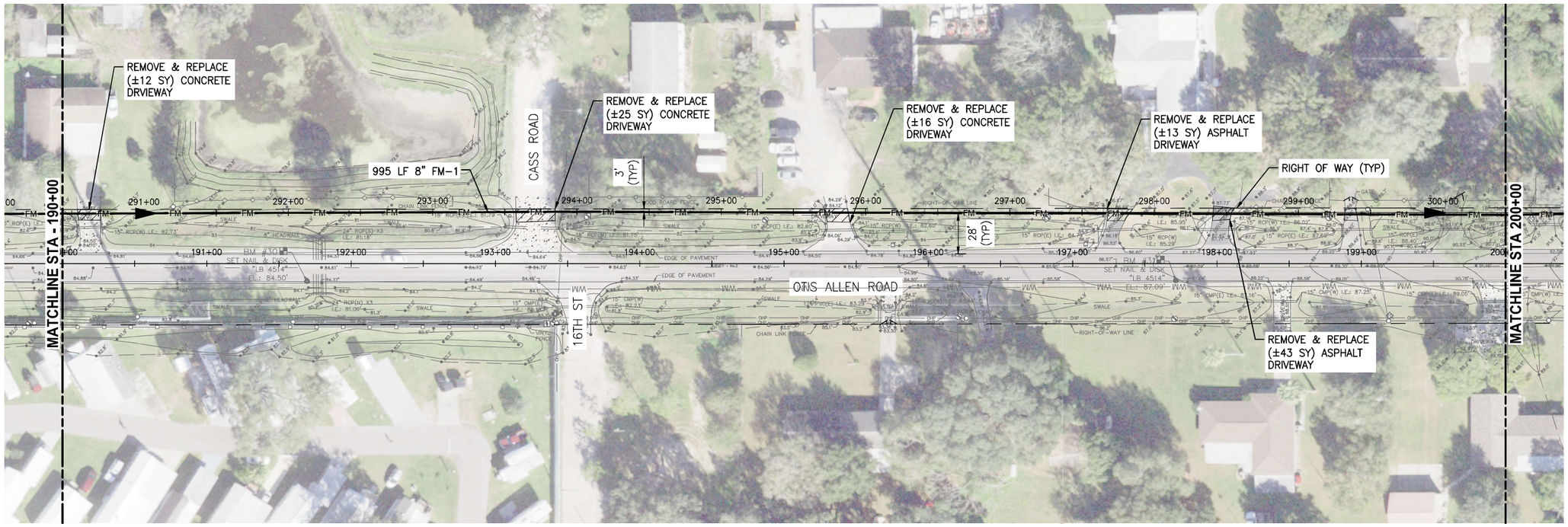
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INDEX NO:	DWG NO: C8

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

OTIS ALLEN RD PLANVIEW

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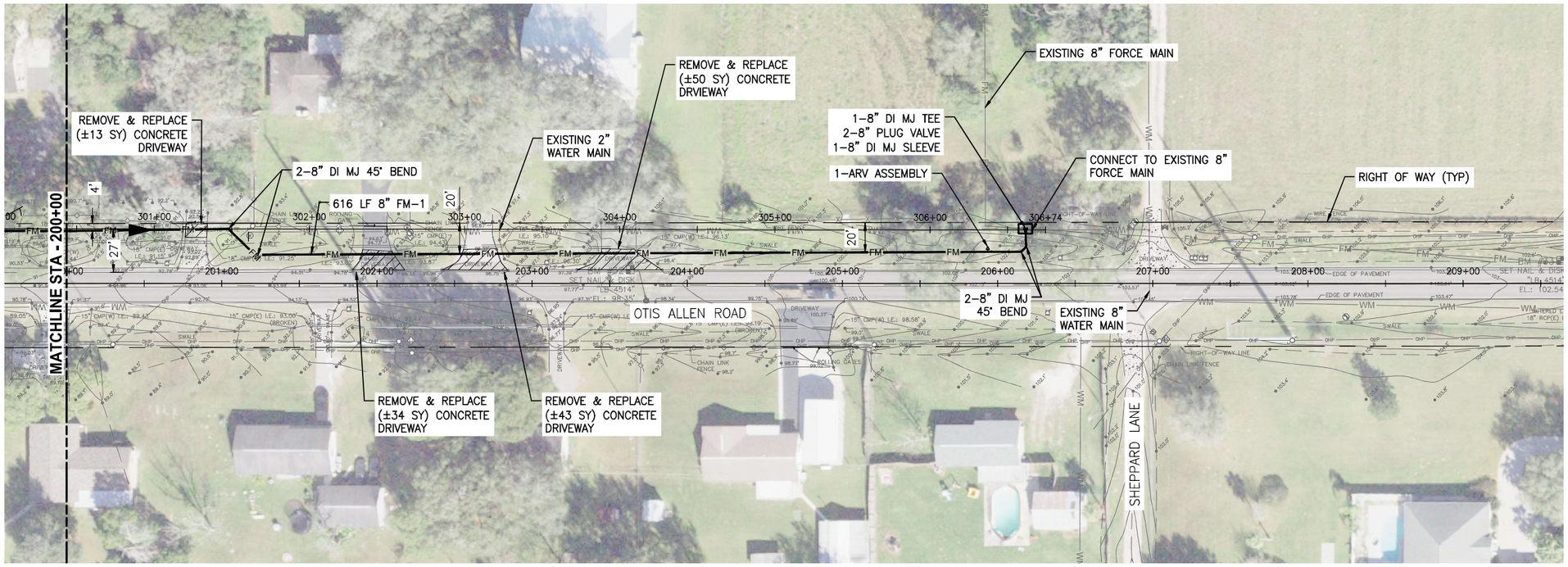
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PROJECT NO:	DATE:
26110-053-01	NOV. 2023
INDEX NO:	DWG NO: C9

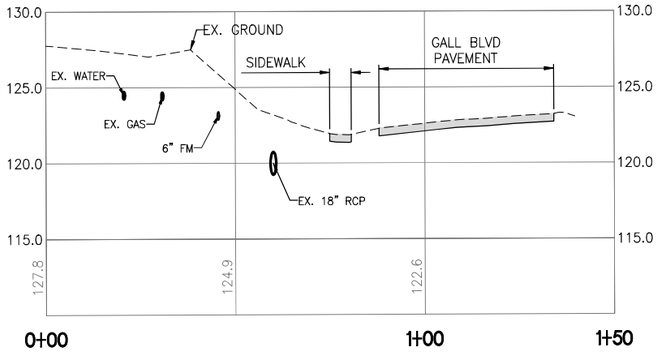
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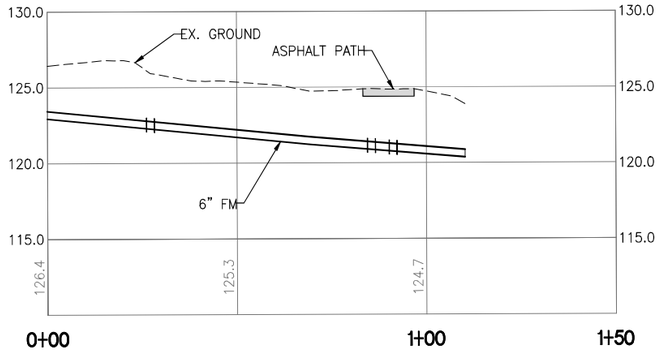
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SCALE IN FEET



SECTION A-A (C7)



SECTION B-B (C7)
N.T.S.

GRAPHIC SCALE
0 2.5 5 10
SCALE IN FEET

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

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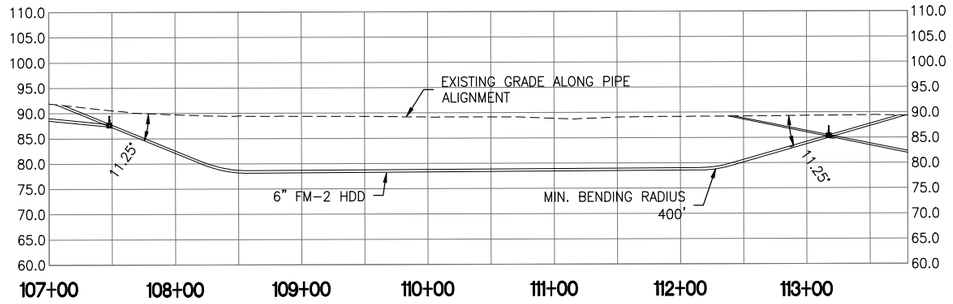
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PROJECT NO: 26110–053–01
DATE: NOV. 2023
INDEX NO:
DWG NO: C10

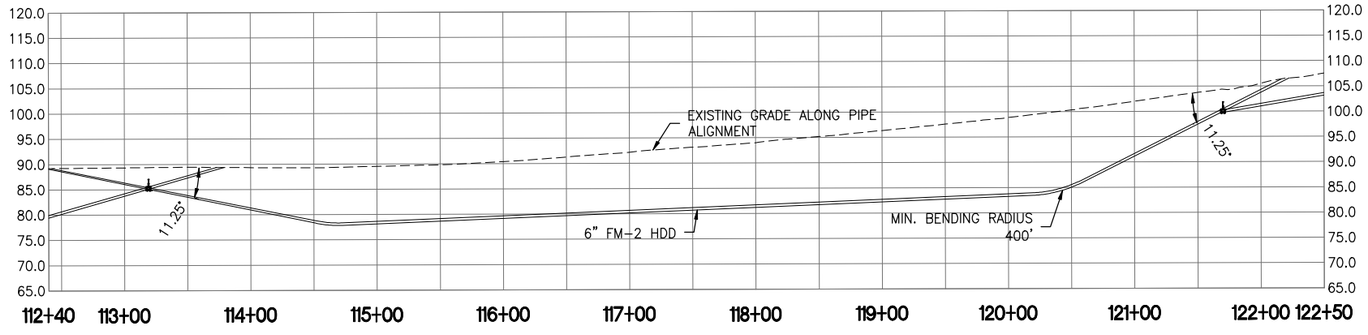
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FM HDD PROFILE 1 (C1)



FM HDD PROFILE 2 (C1)

GRAPHIC SCALE
0 0.5 1 2
SCALE IN FEET
1" = 10' V

GRAPHIC SCALE
0 30 60 120
SCALE IN FEET
1" = 60' H

BID DOCUMENTS

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

HDD PROFILES

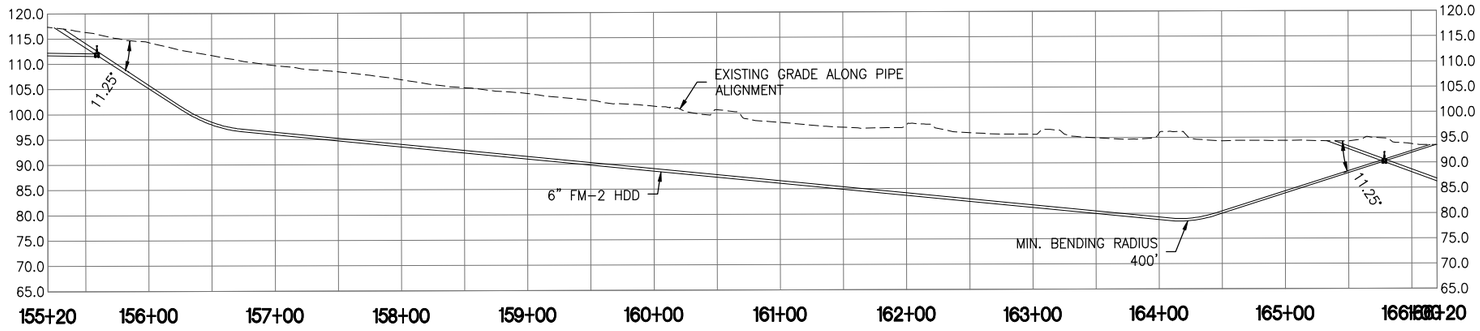
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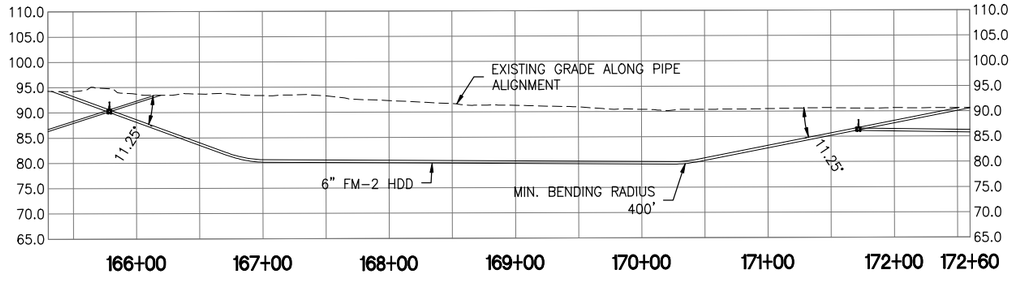
PROJECT NO:	DATE:
26110-053-01	NOV. 2023
INDEX NO:	DWG NO: C11

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FM HDD PROFILE 3
C3



FM HDD PROFILE 4
C4

GRAPHIC SCALE
0 0.5 1 2
SCALE IN FEET
1" = 10' V

GRAPHIC SCALE
0 30 60 120
SCALE IN FEET
1" = 60' H

BID DOCUMENTS

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

HDD PROFILES

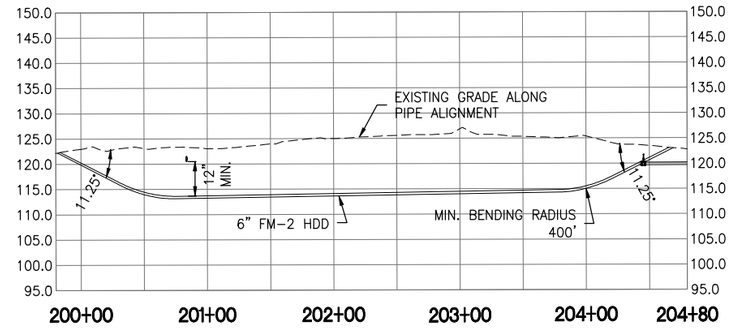
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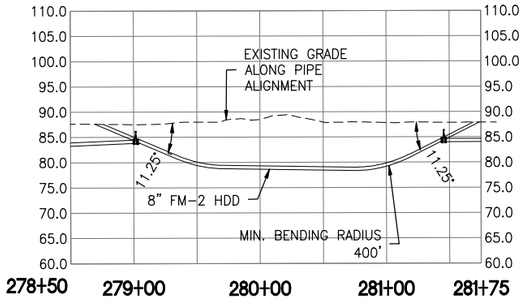
PROJECT NO: 26110-053-01
DATE: NOV. 2023
INDEX NO:
DWG NO: C12

PLOTTED: 11/8/2023 11:24:48 AM KEYLA VIRGILIO, EI

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FM HDD PROFILE 5 (C5)



FM HDD PROFILE 6 (C8)

GRAPHIC SCALE
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SCALE IN FEET
1" = 10' V

GRAPHIC SCALE
0 30 60 120
SCALE IN FEET
1" = 60' H

BID DOCUMENTS

SAVED: 9/29/2023 11:13 AM SSIMS Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\053-01 NORTH SIDE LS PHASE 3\DESIGN&CONSTRUCTION\CAD\DWGS\CIVIL\26110053301-C11.DWG

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

HDD PROFILES

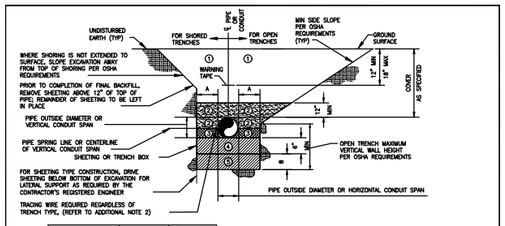
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PROJECT NO: 26110-053-01
DATE: NOV. 2023
INDEX NO:
DWG NO: C13

PLOTTED: 11/8/2023 11:25:02 AM KEYLA VIRGILIO, EI

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NOMINAL PIPE DIAMETER OR HORIZONTAL CONDUIT SPAN (INCHES)	MINIMUM SIDEWALL CLEARANCE A (INCHES)	ADDITIONAL EXCAVATION DEPTH (1) B (INCHES)
LESS THAN 24	12	12
24 AND GREATER	18	18

(1) REQUIRED WHERE UNSUITABLE MATERIAL IS ENCOUNTERED.

ZONE NO.	ZONE NAME	MATERIAL	COMPACTION
1	FINAL BACKFILL	AS SPECIFIED	21" LEVEL SIDE MODIFIED PROCTOR MAXIMUM DRY DENSITY ASTM D-1557 (USER WHEN UNDER PAVEMENT)
2	INITIAL BACKFILL		
3	HAUNCHING		
4	BEDDING		
5	FOUNDATION		

TRENCH ZONE NOTES:

(1) FINAL BACKFILL SHALL BE INSTALLED IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. REFER TO ADDITIONAL NOTE 3.

(2) INITIAL BACKFILL SHALL BE INSTALLED IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HAND TAMPING OR AN APPROVED METHOD OF MECHANICAL TAMPING. REFER TO ADDITIONAL NOTE 3.

(3) HAUNCHING SHALL BE IN COMPLETELY DEWATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HAND TAMPING. HAUNCHING SHALL BE BROUGHT UP EQUALLY ON BOTH SIDES OF THE PIPE.

(4) BEDDING SHALL BE INSTALLED IN COMPLETELY DEWATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT, AND SHALL BE COMPACTED BY HAND OR MECHANICAL TAMPING. PROPERLY SHAPED BELL HOLES SHALL BE EXCAVATED IN THE BEDDING TO PERMIT ASSEMBLY OF THE PIPE. REFER TO ADDITIONAL NOTE 3.

(5) NATIVE, UNDISTURBED MATERIAL IN COMPLETELY DEWATERED TRENCHES MEETING THE COMPACTION AND MATERIAL REQUIREMENTS FOR COMPACTED BEDDING MATERIAL NEED NOT BE REPLACED OR REMOVED, EXCEPT FOR SHAPING OF THE BELL HOLES, AND WHERE REFILL IS REQUIRED.

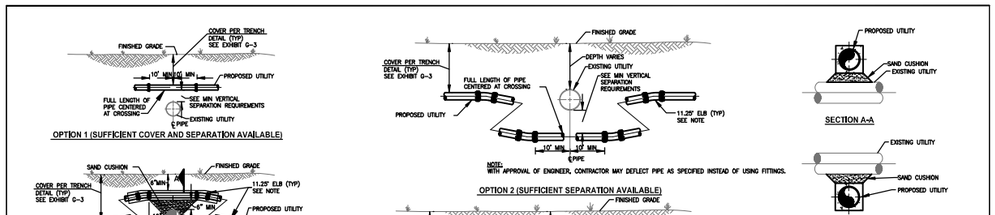
FOUNDATION SHALL BE REQUIRED WHERE UNSUITABLE MATERIAL IS ENCOUNTERED. FOUNDATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS FOR BEDDING. REFER TO ADDITIONAL NOTE 3.

ADDITIONAL NOTES:

1. FOR TRENCHES IN VEHICULAR TRAFFIC AREAS OR BENEATH SURFACE IMPROVEMENTS (EG, SLABS, ASPHALT, ETC.) SEE CONTRACT SPECIFICATIONS FOR ADDITIONAL COMPACTION REQUIREMENTS. SEE DRAWINGS FOR SURFACE IMPROVEMENT AND /OR RESTORATION DETAILS WHERE APPLICABLE.
2. TRACING WIRE SHALL BE INSTALLED ON THE SIDE OF THE PIPE AND ATTACHED TO THE PIPE EVERY 10' W/ A NYLON WIRE TIE. IF THE WIRE IS DAMAGED OR NEEDS TO BE EXTENDED A 3M WATERPROOF TYPE UF SPLICE SHALL BE INSTALLED TO REPAIR THE WIRE. THE ENDS OF THE TRACING WIRE SHALL BE BROUGHT UP IN EVERY VALVE BOX ON THE LINE AND AT THE HYDRANT VALVES. THERE SHALL BE A MINIMUM COIL OF 3' LEFT UNDER THE VALVE BOX COVER. THE WIRE SHALL BE TESTED TO VERIFY CONDUCTIVITY.
3. ALTERNATIVE LIFT THICKNESSES, NOT EXCEEDING 12 INCHES LOOSE MEASUREMENT, ARE ACCEPTABLE IN TRENCH ZONES 1, 2, 4, AND 5 PROVIDED 1) THE LIFT THICKNESS DOES NOT EXCEED THE MAXIMUM VALUE RECOMMENDED IN WRITING BY THE APPLICABLE PIPE MANUFACTURER AND 2) FIELD TEST RESULTS CONFIRM THAT THE SPECIFIED COMPACTION REQUIREMENTS ARE BEING MET.

TYPICAL UTILITY TRENCH DETAIL
NTS

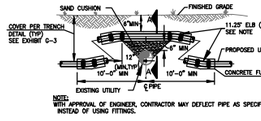
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NOVEMBER 2021
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OPTION 1 (SUFFICIENT COVER AND SEPARATION AVAILABLE)

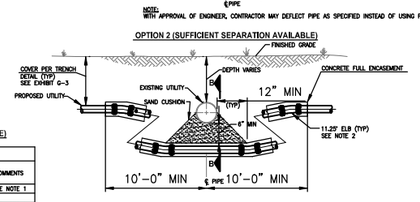
NOTE:
WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

OPTION 2 (SUFFICIENT SEPARATION AVAILABLE)



NOTE:
WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

ALTERNATE OPTION 1 (SUFFICIENT COVER OR SEPARATION NOT AVAILABLE)



NOTES:
1. FOR PROPOSED WATER MAINS, THIS OPTION IS ONLY ALLOWED WITH APPROVAL OF THE ENGINEER AND FDEP ON A CASE BY CASE BASIS.
2. WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

ALTERNATE OPTION 2 (SUFFICIENT SEPARATION NOT AVAILABLE)

PROPOSED UTILITY	MINIMUM VERTICAL SEPARATION REQUIREMENTS						
	POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS	COMMENTS
POTABLE WATER	1'-0"	3'-0"(1,2)	1'-0"(1)	1'-0"(1)	1'-0"	1'-0"	SEE NOTE 1
GRAVITY SANITARY SEWER	1'-6"(2)	1'-0"	1'-0"	1'-0"	1'-0"(2)	1'-0"	
SEWAGE FORCE MAIN	1'-6"(2)	1'-0"	1'-0"	1'-0"	1'-6"(2)	1'-0"	SEE NOTE 2
STORM	1'-0"(1)	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	
RECLAIMED WATER	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	SEE NOTE 2
ELECTRIC TELECOMMUNICATIONS	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	

(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

NOTES:
1. ONLY OPTION 1 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.
2. ONLY OPTION 2 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.

MINIMUM VERTICAL SEPARATION REQUIREMENTS

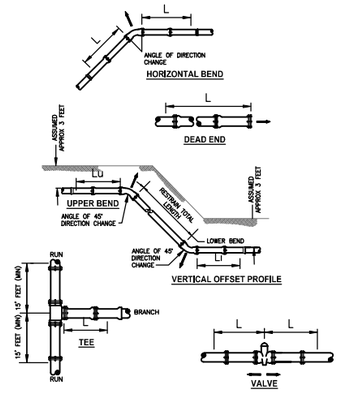
PROPOSED UTILITY	MINIMUM HORIZONTAL SEPARATION EXISTING UTILITY					
	POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS
POTABLE WATER	1'-0"	10'-0"(1,2)	10'-0"(1,2)	3'-0"(1)	3'-0"(1)	3'-0"
GRAVITY SANITARY SEWER	10'-0"(2)	1'-0"	1'-0"	3'-0"	3'-0"(2)	3'-0"
SEWAGE FORCE MAIN	10'-0"(2)	1'-0"	1'-0"	3'-0"	3'-0"(2)	3'-0"
STORM	3'-0"(1)	3'-0"	3'-0"	1'-0"	3'-0"	3'-0"
RECLAIMED WATER	3'-0"(1,2)	3'-0"(2)	3'-0"(2)	3'-0"	1'-0"	3'-0"
ELECTRIC TELECOMMUNICATIONS	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	2'-0"

(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

NOTE:
UTILITIES SHALL NOT BE INSTALLED WITHIN THE DRIP LINE OF TREES WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.

UTILITY CONFLICT

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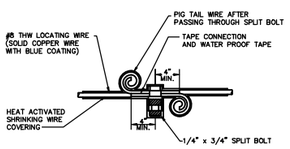


NOMINAL SIZE	VALVES OR DEAD-ENDS	HORIZONTAL BENDS				VERTICAL OFFSET		TEES			REDUCERS	
		90° BENDS	45° BENDS	22.5° BENDS	11.25° BENDS	Lu	Ll	RUN SIZE	BRANCH SIZE	L (FT)	RUN SIZE	L (FT)
10	84	37	16	85	4	35	16	10	≤10	27	12 TO 10	29
12	99	43	18	9	5	41	18	12	≤12	41		

NOTES:
1. THE SCHEDULE SHOWN IS FOR THE FOLLOWING SERVICE CONDITIONS: 150 PSIG; SPECIFIED TRENCH ZONE MATERIAL; 36 INCHES COVER; TYPE 3 LAYING CONDITIONS; AND 1.5 SAFETY FACTOR.
2. RESTRAINED LENGTHS SHOWN IN TABLE ARE IN FEET AND ARE MINIMUM LENGTHS REQUIRED IN EACH DIRECTION FROM FITTING OR VALVES.
3. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING RESTRAINED JOINTS.
4. ALL PIPE SHALL BE RESTRAINED TO THE NEXT JOINT BEYOND THE RESTRAINED LENGTH GIVEN.
5. EACH SIDE OF HDPE TRANSITION FITTINGS SHALL BE RESTRAINED PER THE RESTRAINED JOINT SCHEDULE AS AN IN-LINE VALVE.

TYPICAL RESTRAINED JOINT DETAIL
NTS

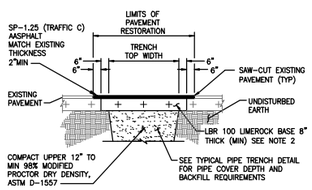
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NOTES:
1. THE ENDS OF ALL LOCATING WIRES, WHETHER THEY ARE SPLICED, CONNECTED, OR TERMINATED, SHALL HAVE THE LAST THREE INCHES PIG TAILED AS DETAILED HEREON.
2. AFTER INSTALLATION OF THE LOCATING WIRE THE SYSTEM SHALL BE SUBJECTED TO TESTING, IN THE PRESENCE OF CITY UTILITIES STAFF PRIOR TO BACKFILL, IN ORDER TO THAT THE SYSTEM IS FUNCTIONAL.

LOCATING WIRE SPLICING
NOT TO SCALE

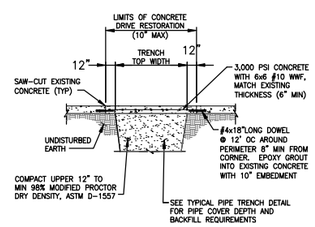
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NOTES:
1. ASPHALT PAVEMENT RESTORATION DETAIL APPLIES TO CITY ROADS, DRIVEWAYS, PRIVATE ROADS, DRIVES, MISCELLANEOUS PATCHES, AND SIMILAR RESTORATION.
2. NEW LIMEROCK TO BE COMPACTED TO NOT LESS THAN 98% MODIFIED PROCTOR DRY DENSITY, ASTMD-1557.
3. FOR COUNTY ROADS AND STATE ROADS, DESIGN SHALL BE IN COMPLIANCE WITH PASCO COUNTY STANDARDS AND FDOT STANDARDS RESPECTFULLY.

ASPHALT PAVEMENT RESTORATION
NTS

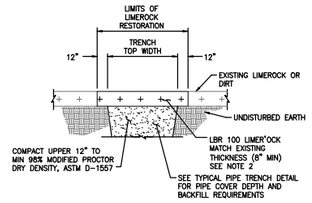
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NOTES:
MATCH EXISTING GRADE AND FINISH.

CONCRETE DRIVE RESTORATION
NTS

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NOVEMBER 2021
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NOTES:
1. LIMEROCK PAVEMENT RESTORATION DETAIL APPLIES TO COUNTY ROADS, DRIVEWAYS, PRIVATE ROADS, DRIVES, MISCELLANEOUS PATCHES, AND SIMILAR RESTORATION.
2. NEW LIMEROCK TO BE COMPACTED TO NOT LESS THAN 98% MODIFIED PROCTOR DRY DENSITY, ASTMD-1557.

LIMEROCK RESTORATION
NTS

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NOVEMBER 2021
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BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

CIVIL DETAILS

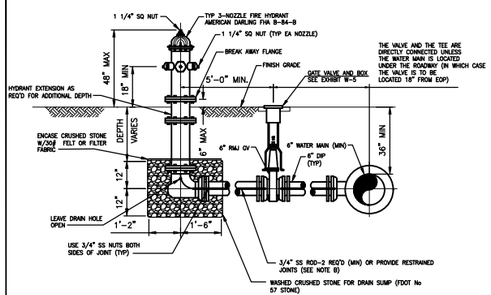
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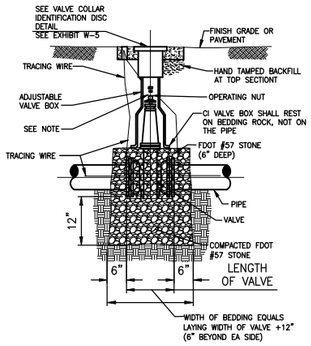
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NOTES:
A. FIRE HYDRANT INSTALLATION SHALL BE IN ACCORDANCE WITH THE CITY'S LAND DEVELOPMENT CODE.
B. 3/4" STAINLESS STEEL ROD CUT AND THREADED AS REQUIRED, OR PROVIDE RESTRAINED JOINTS.
C. FIRE HYDRANTS SHALL BE INSTALLED BETWEEN 3' AND 7' FROM EDGE OF PAVEMENT.
D. TIE RODS, NUTS, WASHERS AND OTHER FASTENERS SHALL BE GALVANIZED OR TYPE 316 STAINLESS STEEL.
E. 4 1/2" PUMPER NOZZLE TO BE PERPENDICULAR TO CENTERLINE OF MAJOR STREET.
F. FIRE HYDRANT ASSEMBLY INCLUDES ALL THAT IS SHOWN INCLUDING DI PIPE TO R/W, DIP TEE AT MAIN, HYDRANT, REDUCERS, VALVE, HYDRANT EXTENSIONS, VALVE EXTENSIONS, ALL PIPING AND MISCELLANEOUS APPURTENANCES REQUIRED FOR A COMPLETE INSTALLATION.
G. FOR FIRE HYDRANTS ALONG PAVED ROADWAYS, INSTALL RAISED PAVEMENT MARKER FOR FIRE HYDRANT IDENTIFICATION. MARKER SHALL BE BLUE AND IN ACCORDANCE WITH FDOT 706. MARKER SHALL BE LOCATED IN THE CENTER OF CLOSEST LANE PERPENDICULAR TO FIRE HYDRANT.

FIRE HYDRANT DETAIL
NTS

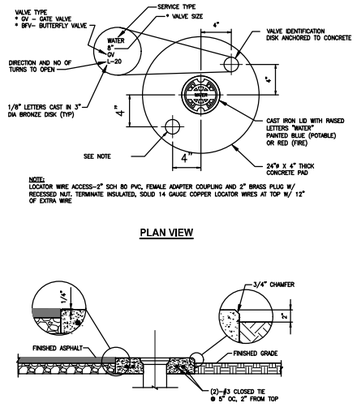
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NOVEMBER 2021
W-10



NOTES:
1. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.
2. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.

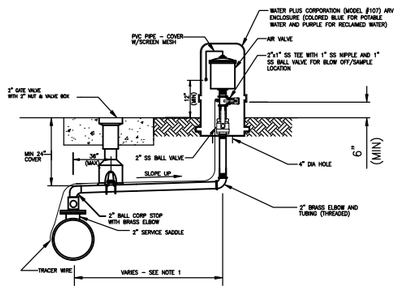
GATE VALVE BOX
NTS

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VALVE COLLAR AND IDENTIFICATION DISK
NTS

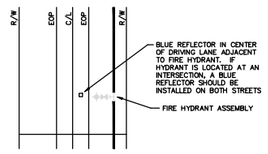
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NOVEMBER 2021
W-5



NOTES:
1. OFFSET DISTANCE SHOWN ON DRAWINGS.
2. ADJUST HORIZONTAL LOCATION OF ARV ENCLOSURE, AS REQUIRED TO AVOID SIDEWALK. LOCATE ARV ENCLOSURE WITHIN 1' OF R/W OR AS OTHERWISE DETERMINED BY THE CITY.

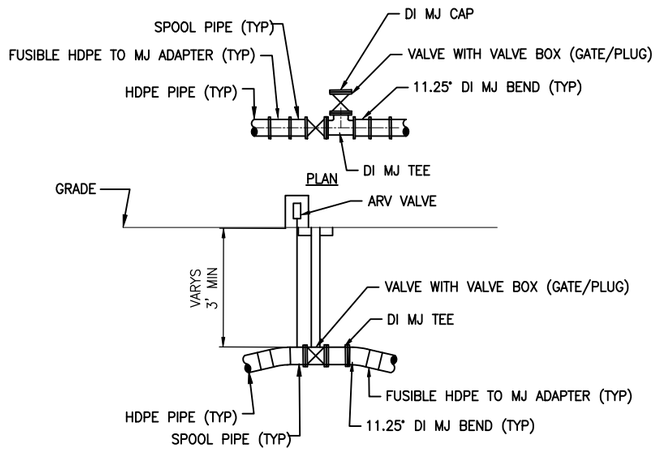
OFFSET AIR VALVE DETAIL
NTS

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FIRE HYDRANT REFLECTOR DETAIL
NOT TO SCALE

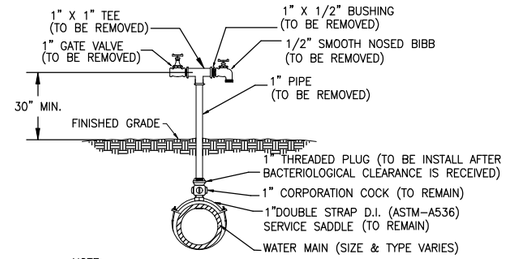
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DECEMBER 2015
W-11



PIPE TRANSITION DETAIL
NTS

1

NOTES:
(1) ALL CONNECTIONS SHALL BE RESTRAINED.
(2) FITTING CALLOUTS AS SHOWN IN DETAIL ARE FOR CONCEPTUAL PURPOSES. SEE PLANS FOR SPECIFIC FITTING AND PIPE CALLOUTS AT PIPE TRANSITIONS AND OTHER LOCATIONS.



NOTE:
1) LOCATION OF SAMPLE POINT BIBB SHALL NOT BE WITHIN THE ROADWAY BUT ROUTED TO THE ROADWAY SHOULDERS (NON-TRAFFIC AREAS) OF THE ROAD (WHERE APPLICABLE)
2) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL PIPING & FITTINGS NOTED AFTER BACTERIOLOGICAL CLEARANCE IS RECEIVED FROM THE HEALTH DEPARTMENT.

1" BACTERIOLOGICAL SAMPLE POINT DETAIL
N.T.S.

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BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

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DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

CIVIL DETAILS

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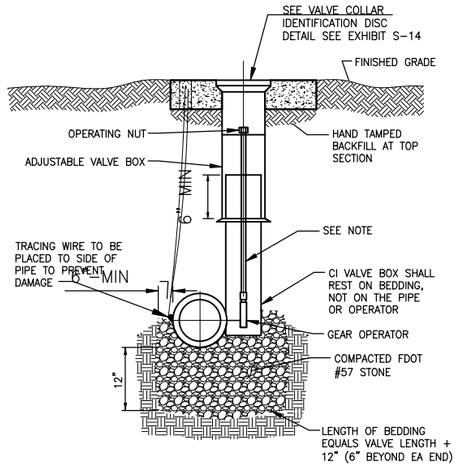
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DATE: NOV. 2023
INDEX NO:
DWG NO: C15

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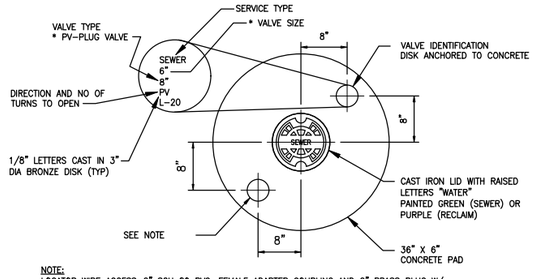
NOTES:
1. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.
2. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.

PLUG VALVE
NTS

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613

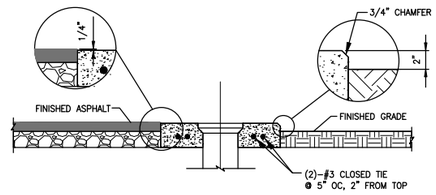
NOVEMBER 2021

S-12



NOTE:
LOCATOR WIRE ACCESS-2" SCH 80 PVC, FEMALE ADAPTER COUPLING AND 2" BRASS PLUG W/ RECESSED NUT. TERMINATE INSULATED, SOLID 14 GAUGE COPPER LOCATOR WIRES AT TOP W/ 12" OF EXTRA WIRE

PLAN VIEW



VALVE COLLAR AND IDENTIFICATION DISK
NTS

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613

NOVEMBER 2021

S-14

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
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8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

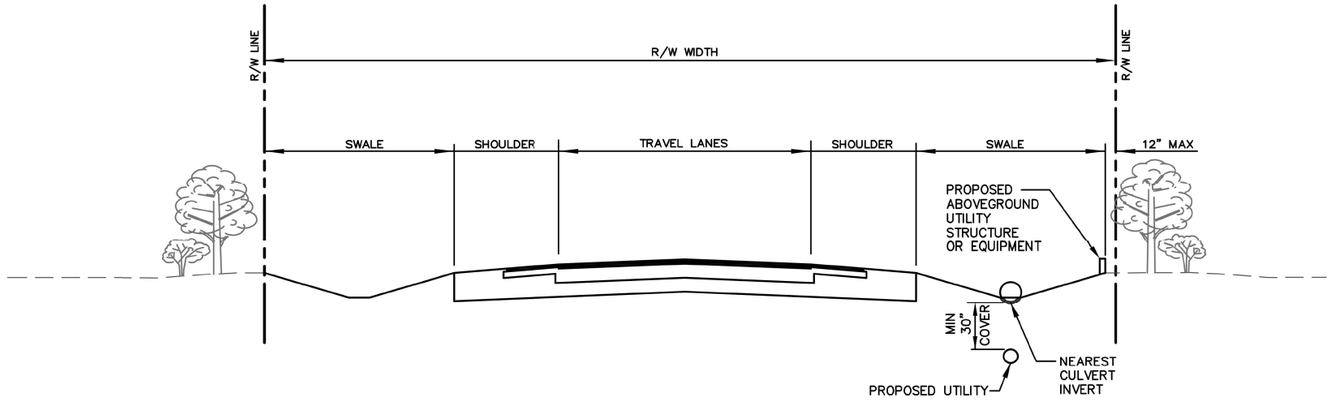
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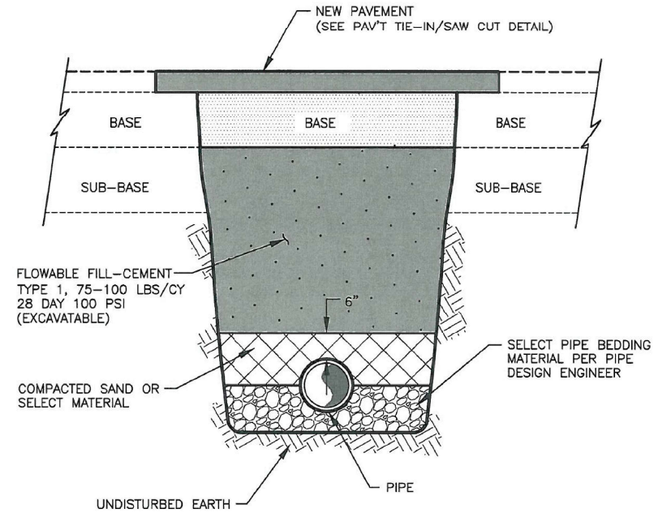


UTILITY INSTALLATION IN SWALE NEAR CULVERT
NTS

NOTE:
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ANY PROPOSED ALTERATIONS SHALL BE CLEARLY IDENTIFIED AND HIGHLIGHTED ON DETAIL.

PASCO COUNTY ENGINEERING SERVICES **DESIGN STANDARDS**	**UTILITY INSTALLATION DETAIL RURAL ROADWAY TYPICAL SECTION**		Sheet No. 1 of 1 Index No. 301
	APPROVED BY JCW	BCC APPROVAL REVISED	

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TYPICAL TRENCH SECTION
NTS

NOTE:
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PASCO COUNTY ENGINEERING SERVICES **DESIGN STANDARDS**	**FLOWABLE FILL**		Sheet No. 1 of 1 Index No. 103
	APPROVED BY JCW	BCC APPROVAL REVISED	

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
MSS CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

CIVIL DETAILS

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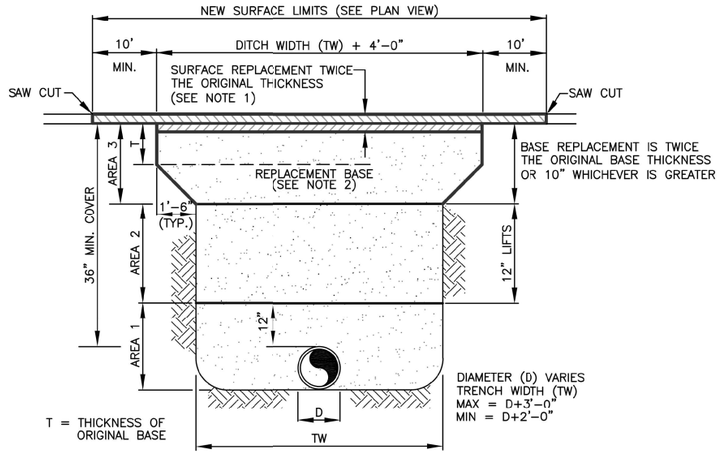
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NOTES

1. REPLACEMENT ASPHALT SHALL BE TWICE THE ORIGINAL PAVEMENT THICKNESS WITH A MINIMUM OF TWO (2) INCHES AND SHALL BE SP 12.5 OR TYPE S-3 ASPHALT, AND FC-3 IF REQUIRED.
2. REPLACEMENT BASE SHALL BE NEW MATERIAL NOT REUSED FROM EXCAVATION. ACCEPTABLE BASE ALTERNATIVE SHALL BE TYPE ABC OR BETTER ASPHALT PLACED AT A TOTAL THICKNESS OF SIX (6) INCHES.
3. AREA 1 – BACKFILL SHALL BE PLACED IN SIX (6) INCH LIFT WITH EACH LIFT COMPACTED TO **98% OF ASTM FM5-521** USING MECHANICAL TAMPERS.
4. AREA 2 – BACKFILL SHALL BE PLACED IN TWELVE (12) INCH LIFTS WITH EACH LIFT COMPACTED TO **98% OF FM5-521** USING APPROPRIATE COMPACTING EQUIPMENT.
5. AREA 3 – LIMEROCK (LBR 100) BASE SHALL BE CONSTRUCTED IN LIFTS NOT GREATER THAN SIX (6) INCHES COMPACTED THICKNESS, AND HAVE A DENSITY EQUAL TO **98% OF FM5-521**.
6. FLOWABLE FILL MAY BE PLACED ABOVE AREA 1 UP TO THE BOTTOM OF THE RESTORED BASE. MIX DESIGN SHALL CONFORM TO FDOT STANDARD SPECIFICATIONS SECTION 121. IF FLOWABLE FILL IS USED FOR TRENCH BACKFILL, THE AMOUNT OF COVER ABOVE TOP OF PIPE TO AREA 2 MAY BE REDUCED TO 6 INCHES.

Tests shall be submitted to Pasco County Engineering Inspections verifying open cut restoration is per general notes before release of permit or gurantee, if applicable. Material and thickness verification shall be required. All testing shall be Pasco County Services Department Testing Specificatiions for Construction of Roads, Storm Drainage and Utilities; October 2006.

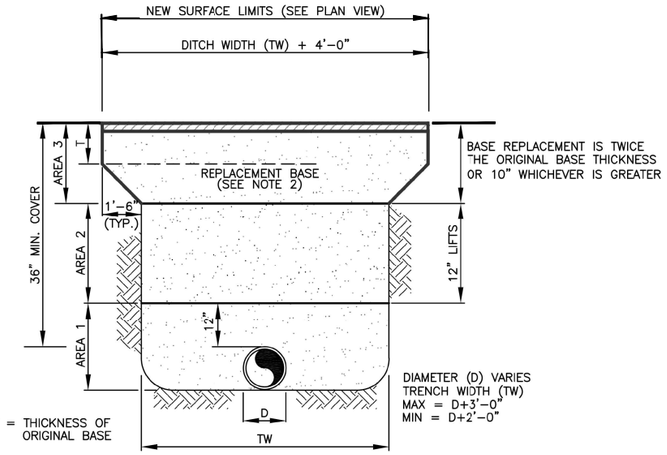
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PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	OPEN CUT RESTORATION	Sheet No. 1 of 1
	APPROVED BY MICHAEL J. GARRETT, P.E. / BCC APPROVAL / REVISED	Index No. 102

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TYPICAL ASPHALT PAVEMENT RESTORATION DETAIL 1

NTS



NOTES

1. REPLACEMENT ASPHALT SHALL BE TWICE THE ORIGINAL PAVEMENT THICKNESS WITH A MINIMUM OF TWO (2) INCHES AND SHALL BE SP 12.5 OR TYPE S-3 ASPHALT, AND FC-3 IF REQUIRED.
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PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	OPEN CUT RESTORATION	Sheet No. 1 of 1
	APPROVED BY MICHAEL J. GARRETT, P.E. / BCC APPROVAL / REVISED	Index No. 102

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TYPICAL LIMEROCK RESTORATION DETAIL 2

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
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8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

CIVIL DETAILS

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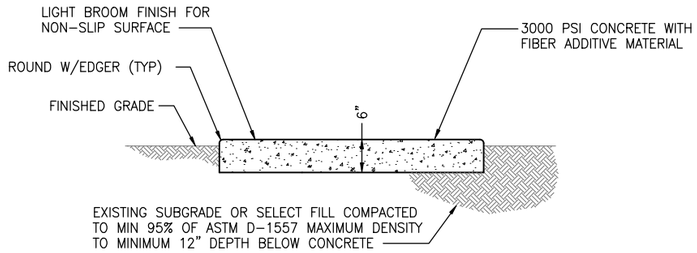
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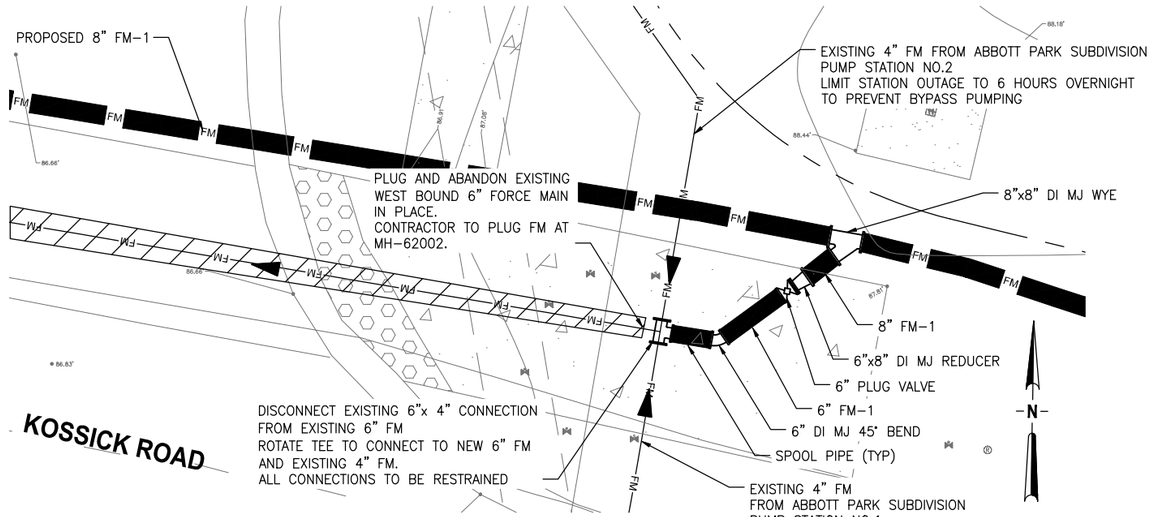
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NOTE:
SIDEWALK JOINTS SHALL BE PER FDOT INDEX 310.

CONCRETE RAMP AND SIDEWALK DETAIL 3

NTS



EXISITNG 6" FM CONNECTION 4

NTS C8

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NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

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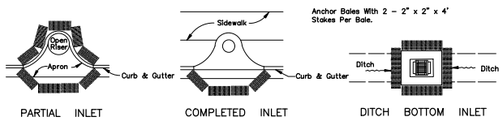
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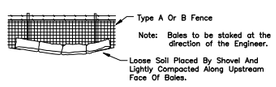
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EROSION AND SEDIMENT CONTROL NOTES

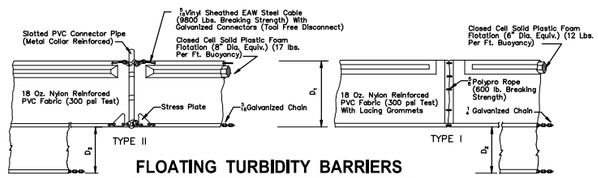
1. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING SILT FROM SITE IF NOT REUSABLE ON-SITE AND ASSURING PLAN ALIGNMENT AND GRADE IN ALL DITCHES AND SWALES AT COMPLETION OF CONSTRUCTION.
2. THE SITE CONTRACTOR IS RESPONSIBLE FOR REMOVING THE TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES AFTER COMPLETION OF CONSTRUCTION AND ONLY WHEN AREAS HAVE BEEN STABILIZED.
3. ADDITIONAL PROTECTION – ON-SITE PROTECTION IN ADDITION TO THE ABOVE MUST BE PROVIDED THAT WILL NOT PERMIT SILT TO LEAVE THE PROJECT CONFINES DUE TO UNSEEN CONDITIONS OR ACCIDENTS.
4. CONTRACTOR SHALL INSURE THAT ALL DRAINAGE STRUCTURES, PIPES, ETC. ARE CLEANED OUT AND WORKING PROPERLY AT TIME OF ACCEPTANCE.
5. WIRE MESH SHALL BE LAID OVER THE DROP INLET SO THAT THE WIRE EXTENDS A MINIMUM OF 1 FOOT BEYOND EACH SIDE OF THE INLET STRUCTURE. HARDWARE CLOTH OR COMPARABLE WIRE MESH WITH 1/2-INCH OPENINGS SHALL BE USED. IF MORE THAN ONE STRIP OF MESH IS NECESSARY, THE STRIPS SHALL BE OVERLAPPED.
6. FDOT NO. 1 COARSE AGGREGATE SHALL BE PLACED OVER THE WIRE MESH AS INDICATED IN D-903. THE DEPTH OF STONE SHALL BE AT LEAST 12 INCHES OVER THE ENTIRE INLET OPENING. THE STONE SHALL EXTEND BEYOND THE INLET OPENING AT LEAST 18 INCHES ON ALL SIDES.
7. IF THE STONE FILTER BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER ADEQUATELY PERFORMS ITS FUNCTION, THE STONES MUST BE PULLED AWAY FROM THE INLET, CLEANED AND REPLACED.
8. BALES SHALL BE EITHER WIRE-BOUND OR STRING-TIED WITH THE BINDINGS ORIENTED AROUND THE SIDES RATHER THAN OVER AND UNDER THE BALES.
9. BALES SHALL BE PLACED LENGTHWISE IN A SINGLE ROW SURROUNDING THE INLET, WITH THE ENDS OF ADJACENT BALES PRESSED TOGETHER.
10. THE FILTER BARRIER SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED TO A MINIMUM DEPTH OF 8 INCHES. AFTER THE BALES ARE STAKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AND COMPACTED AGAINST THE FILTER BARRIER.
11. EACH BALE SHALL BE SECURELY ANCHORED AND HELD IN PLACE BY AT LEAST TWO STAKES OR REBARS DRIVEN THROUGH THE BALE.
12. LOOSE STRAW SHOULD BE WEDGED BETWEEN BALES TO PREVENT WATER FROM ENTERING BETWEEN BALES.
13. STRAW BALE BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
14. CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED BALES, END RUNS AND UNDERCUTTING BENEATH BALES.
15. NECESSARY REPAIRS TO BARRIERS OR REPLACEMENT OF BALES SHALL BE ACCOMPLISHED PROMPTLY.
16. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE STRAW BALE BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.
17. SILT FENCES AND FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
18. SHOULD THE FABRIC ON A SILT FENCE OR FILTER BARRIER DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
19. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-THIRD THE HEIGHT OF THE BARRIER.
20. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.
21. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
22. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
23. THE CONTRACTOR IS RESPONSIBLE FOR FOLLOWING THE BEST EROSION AND SEDIMENT CONTROL PRACTICES AS OUTLINED IN THE PLANS, SPECIFICATIONS AND ST. JOHNS RIVER WATER MANAGEMENT DISTRICT SPECIFICATIONS AND CRITERIA.
24. FOR ADDITIONAL INFORMATION ON SEDIMENT AND EROSION CONTROL REFER TO "THE FLORIDA DEVELOPMENT MANUAL – A GUIDE TO SOUND LAND AND WATER MANAGEMENT" FROM THE STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION (F.D.E.R.) CHAPTER 6.
25. EROSION AND SEDIMENT CONTROL BARRIERS SHALL BE PLACED ADJACENT TO ALL WETLAND AREAS WHERE THERE IS POTENTIAL FOR DOWNSTREAM WATER QUALITY DEGRADATION. SEE DETAIL SHEET FOR TYPICAL CONSTRUCTION.
26. ALL DISTURBED AREAS SHALL BE GRASSED, FERTILIZED, MULCHED AND MAINTAINED UNTIL A PERMANENT VEGETATIVE COVER IS ESTABLISHED.
27. SOD SHALL BE PLACED IN AREAS WHICH MAY REQUIRE IMMEDIATE EROSION PROTECTION TO ENSURE WATER QUALITY STANDARDS ARE MAINTAINED.
28. ANY DISCHARGE FROM DEWATERING ACTIVITY SHALL BE FILTERED AND CONVEYED TO THE OUTFALL IN A MANNER WHICH PREVENTS EROSION AND TRANSPORTATION OF SUSPENDED SOLIDS TO THE RECEIVING OUTFALL.
29. DEWATERING PUMPS SHALL NOT EXCEED THE CAPACITY OF THAT WHICH REQUIRES A CONSUMPTIVE USE PERMIT FROM THE ST. JOHNS RIVER WATER MANAGEMENT DISTRICT.
30. ALL DISTURBED AREAS TO BE STABILIZED THROUGH COMPACTION, SILT SCREENS, HAY BALES, AND GRASSING. ALL FILL SLOPES 3:1 OR STEEPER TO RECEIVE STAKED SOLID SOD.
31. ALL DEWATERING, EROSION, AND SEDIMENT CONTROL TO REMAIN IN PLACE AFTER COMPLETION OF CONSTRUCTION AND REMOVED ONLY WHEN AREAS HAVE STABILIZED.
32. THIS PLAN INDICATES THE MINIMUM EROSION AND SEDIMENT MEASURES REQUIRED FOR THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR MEETING ALL APPLICABLE RULES, REGULATIONS AND WATER QUALITY GUIDELINES AND MAY NEED TO INSTALL ADDITIONAL CONTROLS.
33. THE CONTRACTOR SHALL BE REQUIRED TO RESPOND TO ALL WATER MANAGEMENT DISTRICT INQUIRIES, RELATIVE TO COMPLIANCE OF SJRWMD FOR EROSION AND SEDIMENTATION CONTROL. THE COST OF THIS COMPLIANCE SHALL BE PART OF THE CONTRACT.



PROTECTION AROUND INLETS OR SIMILAR STRUCTURES

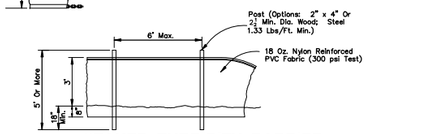


BALES BACKED BY FENCE

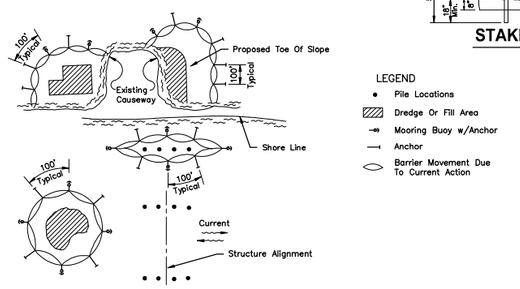


FLOATING TURBIDITY BARRIERS

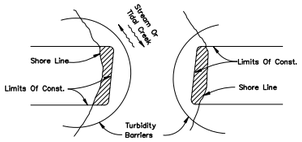
NOTICE:
COMPONENTS OF TYPES I & TYPE II MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES I AND II SHALL BE AS APPROVED BY THE ENGINEER.



STAKED TURBIDITY BARRIER



LEGEND
- Pile Locations
- Dredge Or Fill Area
- Mooring Buoy w/Anchor
- Anchor
- Barrier Movement Due To Current Action



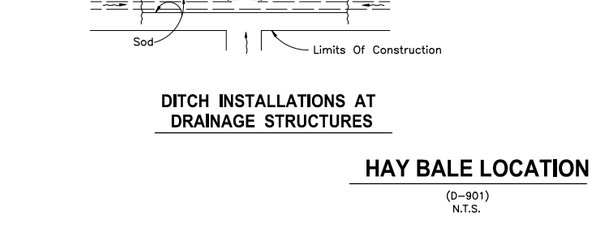
Note:
Turbidity barriers for flowing streams and tidal creeks may be either floating, or staked types or any combinations of types that will suit site conditions and meet erosion control and water quality requirements. The barrier type(s) will be at the Contractors option unless otherwise specified in the plans, however payment will be under the contract lump sum price established in the bid proposal for Erosion & Sediment Control Posts in staked turbidity barriers to be installed in vertical position unless otherwise directed by the Engineer.

NOTES:
1. Turbidity barriers are to be used in all permanent bodies of water regardless of water depth.
2. Number and spacing of anchors dependent on current velocities.
3. Deployment of barrier around pile locations may vary to accommodate construction operations.
4. Navigation may require segmenting barrier during construction operations.
5. For additional information see Section 104 of the FDOT Standard Specifications.

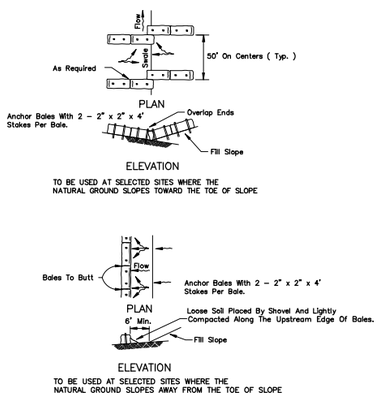
TURBIDITY BARRIER APPLICATIONS

TURBIDITY BARRIERS

(D-907)
N.T.S.



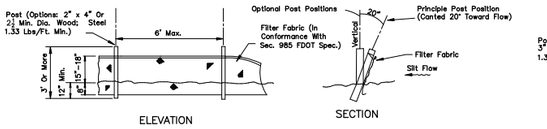
DITCH INSTALLATIONS AT DRAINAGE STRUCTURES



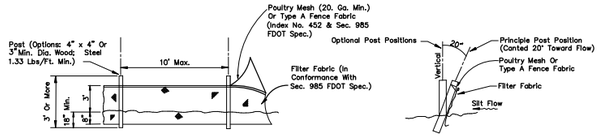
BARRIERS FOR FILL SLOPES

HAY BALE LOCATION

(D-901)
N.T.S.

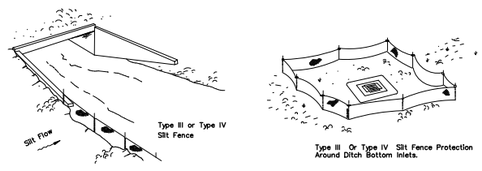


TYPE III SILT FENCE

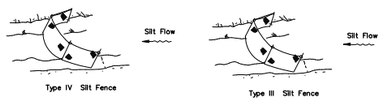


Note: Silt Fence to be paid for under the contract lump sum price for Erosion and Sediment Control.

TYPE IV SILT FENCE



Do not deploy in a manner that silt fences will act as a dam across permanent flowing watercourses. Silt fences are to be used at upland locations and turbidity barriers used at permanent bodies of water.

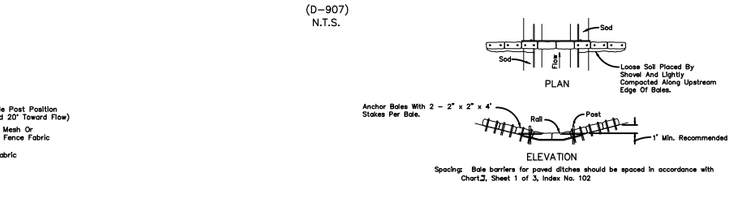


Note: Spacing for Type III & TYPE IV Fence to be in accordance with Chart 1, Sheet 1 of 3, FDOT Index No. 102 and ditch installations at drainage structures Sheet 2 of 3, FDOT Index No. 102.

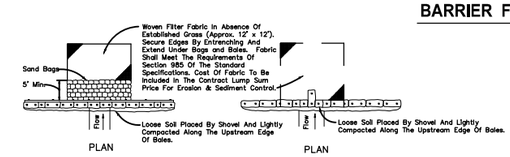
SILT FENCE APPLICATIONS

SILT FENCE TYPE III & IV

(D-908)
N.T.S.



BARRIER FOR PAVED DITCH



BARRIER FOR UNPAVED DITCHES

NOTE:
WHERE FDOT SPECS AND INDEX ARE REFERENCED, PLEASE REFER TO FDOT ROADWAY & TRAFFIC DESIGN STANDARDS, AND FDOT STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION.

HAY BALE BARRIERS TYPE I & II

(D-912)
N.T.S.

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED SMENARD
DRAWN SSIMS
CHECKED SMENARD

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

STORMWATER POLLUTION PREVENTION DETAILS

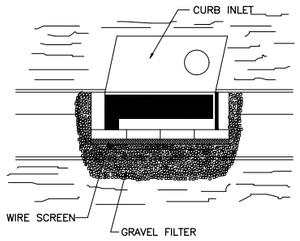
THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY THOMAS W. FRIEDRICH, PE #61281 ON THE DATE ADJACENT TO THE SEAL.

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PROJECT NO: 26110-053-01
DATE: NOV. 2023
INDEX NO:
DWG NO: EC1

SAVED: 8/23/2023 2:05 PM KVIRGILIO Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\053-01 NORTH SIDE LS PHASE 3\DESIGN&CONSTRUCTION\CAD\DWGS\ENV\26110053O1-EC02.DWG

© Jones Edmunds 2234

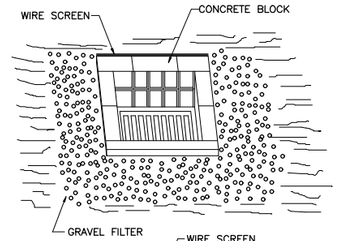


SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE AN OVERFLOW CAPABILITY IS NECESSARY TO PREVENT EXCESSIVE PONDING IN FRONT OF THE STRUCTURE.

BLOCK & GRAVEL CURB INLET SEDIMENT FILTER

(D–902)
N.T.S.



SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.

BLOCK & GRAVEL DROP INLET SEDIMENT FILTER

(D–904)
N.T.S.

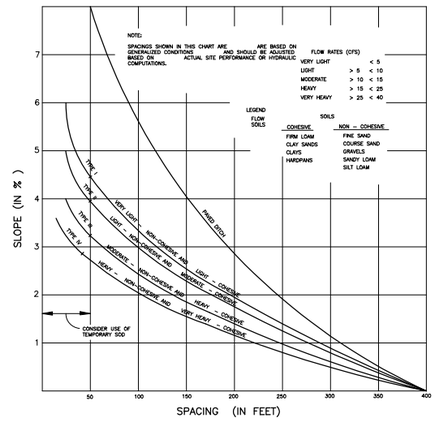
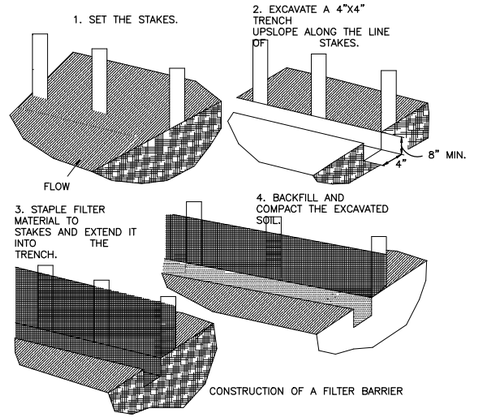


CHART I

RECOMMENDED SPACING FOR TYPE I AND TYPE II HAY BALE BARRIERS, AND TYPE III AND TYPE IV SILT FENCES AND PAVED DITCH HAY BALE BARRIERS

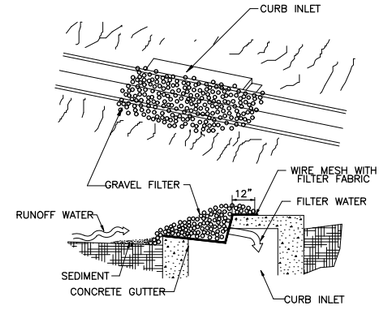
SPACING RECOMMENDATION FOR SILT FENCES & HAY BALES

(D–906)
N.T.S.



FILTER BARRIER CONSTRUCTION DETAIL

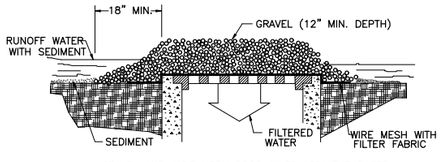
(D–910)
N.T.S.



GRAVEL CURB INLET SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE PONDING IN FRONT OF THE STRUCTURE IS NOT LIKELY TO CAUSE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.



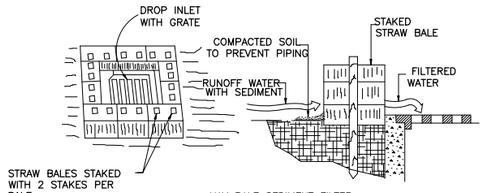
GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY CONCEN– TRATED FLOWS ARE EXPECTED, BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

GRAVEL INLET SEDIMENT TRAP

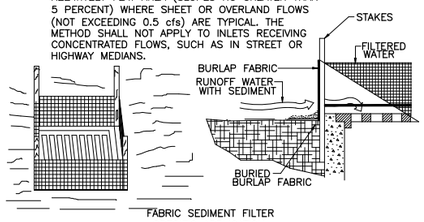
(D–903)



HAY BALE SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 cfs) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.



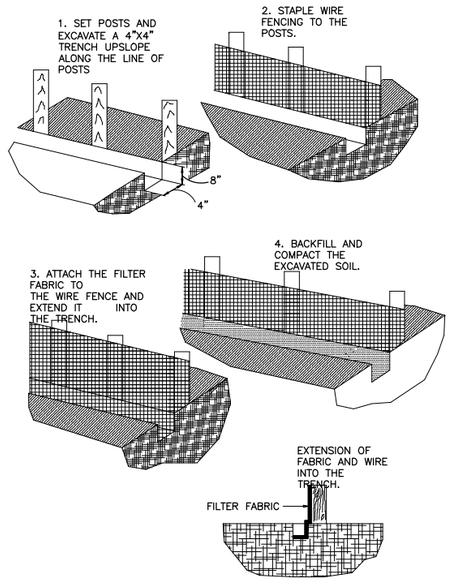
FABRIC SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 cfs) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS. SUCH AS IN STREET OR HIGHWAY MEDIANS.

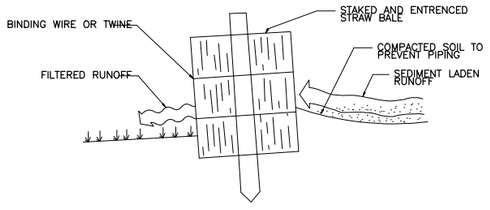
DROP INLET SEDIMENT TRAP

(D–905)



CONSTRUCTION DETAILS FOR SILT FENCES

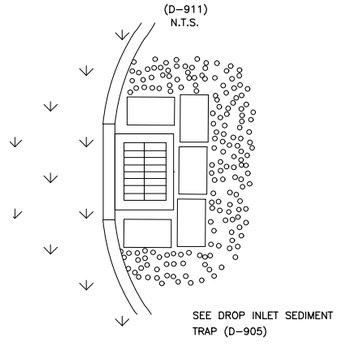
(D–909)
N.T.S.



CROSS–SECTION OF A PROPERLY INSTALLED STRAW BALE

STAKED HAY BALE

(D–911)
N.T.S.



ERECT SEDIMENT BARRIERS AT CATCH BASINS

(TYPICAL)

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED SMENARD
DRAWN SSIMS
CHECKED SMENARD

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377- 5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744- 5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

STORMWATER POLLUTION PREVENTION DETAILS

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY THOMAS W. FRIEDRICH, PE #61281 ON THE DATE ADJACENT TO THE SEAL.

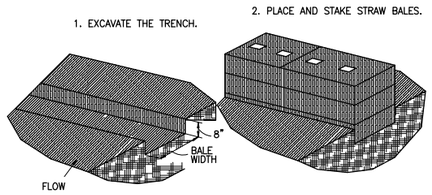
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PROJECT NO: 26110–053–01
DATE: NOV. 2023
INDEX NO:
DWG NO: EC2

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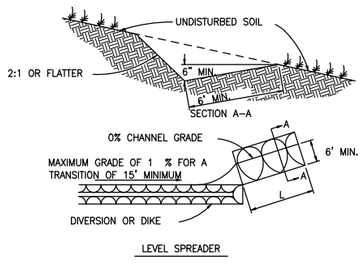
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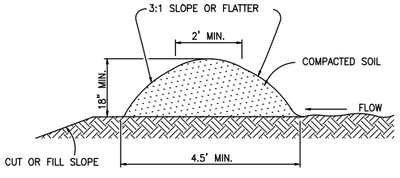
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HAY BALE BARRIER CONSTRUCTION DETAILS

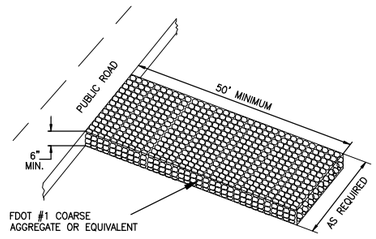
(D-913)
N.T.S.





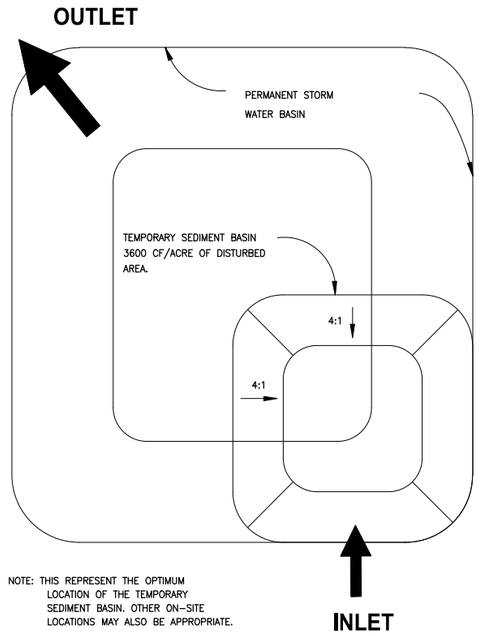
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(D-914)
N.T.S.



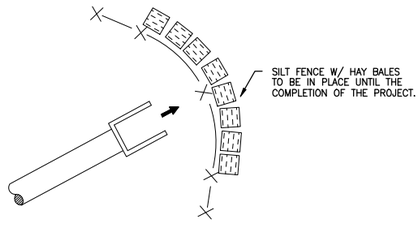
STABILIZED CONSTRUCTION ENTRANCE

N.T.S.



TEMPORARY SEDIMENT BASIN

N.T.S.



OUTLET PROTECTION

N.T.S.

BID DOCUMENTS

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED SMENARD
DRAWN SSIMS
CHECKED SMENARD

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

STORMWATER POLLUTION PREVENTION DETAILS

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY THOMAS W. FRIEDRICH, PE #61281 ON THE DATE ADJACENT TO THE SEAL.

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PROJECT NO: 26110-053-01
DATE: NOV. 2023
INDEX NO:
DWG NO: EC3

CITY OF ZEPHYRHILLS
PRE CONFERENCE AGENDA

DATE: **December 4, 2023, 10:00 a.m.**

Northside Water/Wastewater Forcemain Phase 3

1. (K) Welcome to our 2nd non-mandatory pre-conference for the discussion of the Northside Water/Wastewater Forcemain-Phase 3 project. After this meeting we will conduct a site tour of both projects South 301 Pipeline and Northside Forcemain Phase 3.

2. For those who have called in, please send me an email at kmiller@ci.zephyrhills.fl.us listing your name, company and contact information. Those who are in attendance, please make sure you have filled out our attendance sheet. The City participants of this project are:

i. Karen Miller - City's Purchasing Agent
ii. John Bostic – Utilities Director
iii. Michael Clark – Engineer – Jones Edmunds
iv. Gregg Fruecht – Engineer – Jones Edmunds For thos who have called in, please

3. (K) At this time, I will be turning this meeting over to Gregg to discuss the Northside Water/Wastewater Forcemain-Phase 3.

4. (G) Discuss project scope, plans, specifications and take any questions.

→ Also refer to Meeting Notes on the following page.

5. (K) All Questions should be sent through OPENGOV to Karen Miller, Purchasing Agent. The question will be reviewed and responded to via an Addendum. It will be posted on OPENGOV.

6. (K) **Project Timeline: Northside Water/Wastewater Forcemain-Phase 3**

Bid Time Table	Date		Time
Bid Distribution	11-20-23	Sunday	
Teleconference Pre-Bid*	12-04-23	Monday	10:00 AM
Equivalent/Question Deadline	12-29-23	Friday	10:00 AM
Response Deadline	01-12-24	Friday	10:00 AM
Presented to City Council	02-12-24	Monday	6:00 PM

7. (G/K) **Questions:**

8. Please ensure you have placed your name and company information on the sign in sheet

SITE TOUR

Scope of Work: The City of Zephyrhills is seeking a contractor to construct a force main and water mai along the north side of the City. The project will install approximately 12,500 LF of 6-inch force main along Fort King Road between Phelps Road and Simons Road; then continue east along Kossick Road and terminate near South 301/Gall Blvd. Approximately 3,900 LF of the 6-inch force main will be installed using horizontal directional drilling; the remainder will be installed using open-cut methods. The force main will connect to an existing 8-inch PVC force main along South 301/Gall Blvd.

Continuing on Kossick Road, the 8-inch force main will connect to an existing 6-inch PVC force main near Zephyr Lakes Road and continue east, crossing Wire Road, on Otis Allen Road and connect to the existing 8-inch PVC force main that runs along Otis Allen Road. Approximately 1,100 LF of the 8-inch force main will be installed using horizontal directional drilling; the remainder will be installed using open-cut methods.

The project will install approximately 4,100 LF of 12-inch PVC water main along Kossick Road between Fort King Road and Green Slope Drive. The water main will be installed using open-cut methods, no HDD is proposed. The water main will connect to an existing 12-inch PVC water main on Fort King Road and connect to an existing 12-inch PVC water main on Green Slope Drive. No new residential, commercial, or industrial services will be constructed.

This project is sized to accept future additional flows.

All design constraints will comply with the City's standard design requirements and State of Florida building requirements. Please download the package, plans, and specification for complete details.

Estimated Cost: $4.5 million

Hours of Operation: 7:00 AM – 6:00 PM, Monday – Friday,
Refer to Technical Specifications Section 1.06

Completion Time: Total estimated project time is about 15 months from Notice to Proceed
Estimated three (3) months for equipment procurement and 12 months
for construction

TelePreConference: **Monday, December 4, 2023 or Meet at City Hall-2nd Flr Conf Rm**
Link: https://meet.goto.com/159259221
Phone: 1-224-501-3412
Access Code: 159-259-221

This Teleconference will be hosted live at City Hall and via GoTo. Should you attend the meeting in person there will be a visit of the areas.

See next page for location map

Meeting Notes:

1) The Contractors were advised that the majority of this project is in a rural area with residences and the awarded Contractor should keep local residents \ owners notified when they will be working in the immediate vicinity.

2) The Contractors were reminded to only bid on items shown within the Contract Documents.

ITB 2023-02 and ITB 2023-03 South 301 Pipeline and Northside Forcemain-Ph 3

COMPANY	South 301	Northside	CONTACT	PHONE	CELL	EMAIL
Accurate Drinning Systems	x	x	Larry Roof	561-248-0230	561-248-0270	Larry@ADSPipediv.com
Accurate Drinning Systems	x	x	Chuck Emering	973-978-7859	973-978-7859	charles@Accuratedrilling.com
Castle	x	x	Henry Webre	225-240-3232	225-240-3232	bids@wearecastle.com
B&B Underground	x	x	Michael Bage	682-554-4685	682-554-4685	Michael@bbunderground.com
Benchmark Construction	x	x	Emme Waterman	863-585-3440	863-585-3440	Emmew@bmk8.com
Harbor Contracting	X	X	Anthony	Call In		
Amici Engineering	X	X	Bob Tiesler	Call In		
Kamminga & Roodvoets Inc	X	X	Clay Barnes	Call In		
DB Civil Construction	X	X	None Listed	Call In		
None Listed	x	x	Delaney Marsonek	Call In		
BRW Contracting	x	x	Dylan Northrup	Call In		
BRW Contracting	X	X	Jim Pietracatella	Call In		
Midsouth Inc	X	X	Trae Arlt	Call In		
None Listed	X	X	Charles Cerullo	Call In		

PLEASE LEAVE YOUR BUSINESS CARD

City of Zephyrhills			Karen Miller	813-780-0000 x3536	kmiller@ci.zephyrhills.fl.us
City of Zephyrhills			John Bostic		
City of Zephyrhills			OJ Kurk		
City of Zephyrhills			CJ Funnell		
Jones Edmunds			Mike Clark		
Jones Edmunds			Greg Freucht		
Jones Edmunds			Christopher Seufert		

NORTHSIDE LIFT STATION –
WATER/ WASTEWATER FORCE MAIN - PHASE 3
CITY OF ZEPHYRHILLS

City Bid No. ITB 2023-02
Jones Edmunds Project No. 26110-053-01

ADDENDUM NO. **2**

December 28, 2023

BIDS DUE: 10:00 AM, Local Time, January 12, 2024

TO ALL CONTRACTORS BIDDING ON THIS PROJECT:

The changes, additions, substitutions, and/or deletions contained in Addendum No. 3 are hereby made part of the Contract Documents fully and completely for the construction of the City of Zephyrhills Northside Lift Station, Water / Wastewater Force Main, Phase 3, Jones Edmunds & Associates, Inc., Project No. 26110-053-01, for the City of Zephyrhills, dated December 2023.

Bidders Question:

1. What are the sod quantities for this project?

1. **City / Engineer's Response:** Reimbursement for sod is incidental to bid items 5,6,7, and 8. The actual quantities is dependent on limiting the collateral damage of the existing grass and the limits of construction impacts.

Bidders Question:

2. I have a question regarding a connect to existing that is called out on the plans. The sheet number is C-10. "When the proposed FM is called out to connect to existing FM on Sheet C-10, the listed materials show an 8" DI MJ TEE. Will the connection be cut in? If so, Will we be able to have the line shut down for the required activity? If the line will not be available for a temporary shutdown, will a Tapping sleeve be authorized for use on this connection? Will bypass pumping be needed for this?"

   Please provide me with a clear and concise explanation for moving forward on this bid.

2. **City / Engineer's Response:** The City can drawdown the Wet-Well at Lift Station #50 which discharges to the existing 8" Force Main so that the proposed new Tee and Valve can be installed. It is anticipated the drawdown of LS #50 would allow 45 minutes to complete the installation. If additional time is necessary, the Contractor will need to provide a Vac truck at LS #50 to maintain the dry Wet-Well and FM until the Tee tie-in and valve is completed.

Bidders Question:

3. Please advise if all Domestic Materials are required for this project.
3. **City / Engineer's Response:** Domestic Materials, Buy America-Build America, and American Iron Steel regulations do not apply to this project.

Bidders Question:

4. SECTION 01100 SUMMARY OF WORK – B. The Work of this project includes:
   1. Installing approximately 6,000 linear feet (LF) of 6-inch sanitary sewer force main beginning at C Avenue on Gall Boulevard turning onto Tucker Road and ending west of the railroad tracks. Please clarify if the quantities on the bid form are accurate. The bid form is showing 12,978 LF of open cut and 5000 LF of HDD.
4. **City / Engineer's Response:** The above question does not pertain to this project. The bidder shall resubmit the inquiry to the correct project file.

Bidders Question:

5. Please advise if signed and sealed bore calculations are required for this project.
5. **City / Engineer's Response:** Per Specification 02740-2,1.02, I, .. the Contractor shall submit a signed and sealed bore plan before commencing any drilling activities. This is a significant quality control element due to the immediate proximity of the Lake depicted on Sheet C-1.

Bidders Question:

6. Please provide the Dollar amount for the Testing Allowance to provide consistency among Contractors and to prevent unnecessary inflated bid numbers.
6. **City / Engineer's Response:** An updated Bid Form has been posted to address this concern and is herein included in this Addendum 4.

Bidders Question:

7. Please provide the Dollar amount for the Record Drawing Allowance to provide consistency among Contractors and to prevent unnecessary inflated bid numbers.
7. **City / Engineer's Response:** An updated Bid Form has been posted to address this concern and is herein included in this Addendum 4.

Bidders Question:

8. Please advise if a field office is mandatory or is up to the discretion of the Contractor.
8. **City / Engineer's Response:** It is at the Contractor' discretion whether or not to set-up a field office.

Bidders Question:

9. Please provide the type of sod that required for this project.
9. **City / Engineer's Response:** The Contractor shall restore sodding to match the existing type of grass in place.

Bidders Question:

10. 2.07 GASKETS – Gaskets for mechanical joints shall be compatible with potable water or sewage pipe service. Please provide the type of gaskets required for the DI MJ Force Main Fittings.
10. **City / Engineer's Response:** Per Specification Section 2.11, Ductile Iron Fittings for Sewage Pipe require Buna N, Garlock Style 9122, or equal gaskets. Per Specification section 2.10 Ductile Iron fittings for Potable Water require EPDM, Viton, or Approved equal materials.

Bidders Question:

11. When the proposed FM is called out to connect to the existing FM on Sheet C-8, it states that a shutdown will be authorized overnight with a 6-hour limit. Is there a specified timeframe that has shown to have the lowest flow rates historically that should be taken into consideration when commencing the shutdown and connection?
11. **City / Engineer's Response:** Sheet C-19 Detail 4 includes the notation pertaining to the limited shut down time of local Lift Station 2 to eliminate the necessity for a Temporary By-Pass system. The Contractor shall coordinate this activity with the City. It is anticipated this work will not be conducted until after 9 pm.

Bidders Question:

12. For the existing FM that is shown running to MH-62002, the instructions state to simply abandon that line. Will this line need to be grout filled and abandoned or will it be abandoned in place with no grout? Sheet C-8 for reference.
12. **City / Engineer's Response:** Sheets C-8 and Detail Sheet C-19 have been updated and attached herein to this Addendum 2 to further clarify the area for the tie-in of the new 8 inch Force Main and the existing 6 inch Force Main to be Abandoned In Place (AIP) with grout. Similarly, the Measurement and Payment Item 5 "6 -Inch, 8-Inch Sanitary Sewer Force Main via Open-Cut" has been updated to reflect that reimbursement for the grouting activity is inclusive of Bid Item 5.

Bidders Question:

13. In reviewing the plans, we've noticed potential discrepancies in existing driveways' materials compared to the proposed open-cutting for FM and water lines. Can you advise on how to address this in our bid? Will there be a plan addendum to clarify these details for accuracy?
13. **City / Engineer's Response:** An updated Bid Form has been posted to address this concern and is herein included in this Addendum 4. Revised drawings will be posted via separate Addendum.

Bidders Question:

14. Please provide accurate separate quantities for the 6" and the 8" FM via HDD. The same way it's identified in the South 301 W Water and Wastewater project.
14. **City / Engineer's Response:** An updated Bid Form has been posted to address this concern and is herein included in this Addendum 4.

Bidders Question:

15. Please provide accurate separate quantities for the 6" and the 8" FM via Open-Cut. The same way its identified in the South 301 W Water and Wastewater project.

15. **City / Engineer's Response:** An updated Bid Form has been posted to address this concern and is herein included in this Addendum 4.

Bidders Question:

16. The air valve detail W-13 on Page C15 is for water service. Please confirm that this is the detail you want us to follow for each FM ARV. If not, please provide a detail drawing for the ARV assembly. Please state if you desire offset or vertical, and whether you want a vault or an above ground enclosure.
16. **City / Engineer's Response:** A Detail Figure of a typical Force Main ARV has been herein provided in this Addendum 2. The City requires that ARV's are typically offset above grade. to just within the Right of Way and do utilize vaults.

Bidders Question:

17. The quantities show in the schedule of values, specifically for the pipeline installation and restoration work, do not appear to match the provided plans. Will there be a revised SOV provided that accurately reflect the bid set?
17. **City / Engineer's Response:** An updated Bid Form has been posted to address this concern and is herein included in this Addendum 4. Revised drawings will be posted via separate Addendum.

City / Engineer's Response:

A) A 4' x 8' Project sign will be required to be furnished and installed by the Contractor. The City will determine the location at a later date. A template of the typical sign is included in this Addendum 2.

B) The Approved FDEP Environmental Resource Permit (ERP) is herein provided per this Addendum 2.

C. Measurement and Payment Bid Item 5 "6 -Inch, 8-Inch Sanitary Sewer Force Main via Open-Cut" has been updated per this Addendum 2 to be inclusive of any required vacuum trucks and/or pumps/pipe/fittings for the bypass pumping of sewer flow during force main connections, and grout filling of all existing piping designed to be abandoned in place.

END OF ADDENDUM

CITY OF ZEPHYRHILLS
NORTHSIDE WATER - WASTEWATER FORCE MAIN
PHASE 3

MAYOR
Melonie Bahr Monson

CITY MANAGER
William C. Poe

UTILITIES DIRECTOR
John Bostic, III

COUNCIL MEMBERS
Lance A. Smith
Kenneth M. Burgess, Jr.
Charles E. Proctor
Steven S. Spina, Jr.
Jodi Wilkenson

CONSTRUCTION COST
4,500,000.00

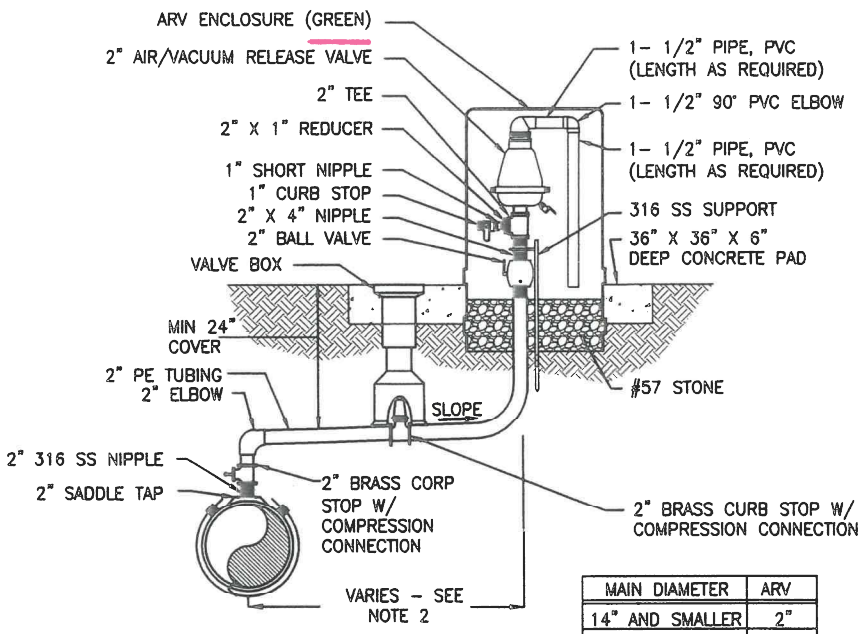
ESTIMATED PROJECT COMPLETION:

CONTRACTOR:

ENGINEER:
JonesEdmunds

CITY OF ZEPHYRHILLS
Northside Phase 3 Force Main/Water Line Extension
CONSTRUCTION ITEMIZED PRICING SHEET

Item No.	Item Description	Qty.	Unit	Unit Price	Amount
BASE BID					
1	Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions	1	LS		
2	Traffic Control	1	LS		
3	Environmental Protection	1	LS		
4	Construction Survey and Layout	1	LS		
5	6-Inch Sanitary Sewer Force Main via Open-Cut	9,350	LF		
6	6-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	3,400	LF		
7	8-Inch Sanitary Sewer Force Main via Open-Cut	4,874	LF		
8	8-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	250	LF		
9	12-Inch Potable Water Main via Open-Cut	4,525	LF		
10	Combination Air/Vacuum Valves and Vaults	14	EA		
11	Concrete Restoration	2,150	SY		
12	Limerock Restoration	406	SY		
13	Asphalt Concrete Restoration	1,033	SY		
14	Testing Allowance	1	AL		$25,000.00
15	Record/As-Built Drawings Allowance	1	AL		$15,000.00
	TOTAL BID PRICE				



MAIN DIAMETER	ARV
14" AND SMALLER	2"
16" AND LARGER	3"

NOTES:
1. FOR WASTEWATER USE ONLY.
2. OFFSET DISTANCE TO BE FIELD DETERMINED AND AS CLOSE TO THE R/W LINE AS POSSIBLE.
3. ADJUST HORIZONTAL LOCATION OF SIDEWALK, AS REQUIRED TO AVOID ARV ENCLSOURE.
4. LOCATE ARV ENCLOSURE WITHIN 6" OF R/W LINE.

COMBINATION AIR/VACUUM RELEASE VALVE DETAIL

NTS

JonesEdmunds

FLORIDA DEPARTMENT OF
Environmental Protection

Southwest District Office
13051 North Telecom Parkway #101
Temple Terrace, Florida 33637-0926

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

December 21, 2023

City of Zephyrhills
% John Bostic, III
5335 8th Street
Zephyrhills, Florida 33542
Jbostic@ci.zephyrhills.fl.us

File No.: 51-0441987-001-EG, Pasco County

Dear John Bostic III:

On November 7, 2023, we received your notice of intent to use a General Permit (GP), pursuant to Rule 62-330.453, Florida Administrative Code, F.A.C., to install 4,000 linear feet of 12-inch water main via open cut trenching and horizontal directional drilling under Bird Lake, a Class III Florida waterbody. The project is located on Parcel IDs: 27-25-21-0000-49900-0070, 34-25-21-0000-49900-0020, 34-25-21-0020-49900-0000, 34-25-21-0000-49900-1240, 34-25-21-0000-49900-1230, 34-25-21-0000-49900-1220, 34-25-21-0000-49900-0000, 34-25-21-0000-49900-1190, 34-25-21-0010-49900-0010, 34-25-21-0010-00100-0020, 34-25-21-0000-29900-0000, 35-25-21-0130-49900-0000, 26-25-21-0000-49900-0010, Zephyrhills, Sections 26/27/34/35, Township 25 South, Range 21 East, Pasco County.

Your intent to use a general permit has been reviewed by Department staff for three types of authorizations: (1) regulatory authorization, (2) proprietary authorization (related to state-owned submerged lands), and (3) federal authorization. The authority for review and the outcomes of the reviews are listed below. Please read each section carefully.

Your project did not qualify for federal authorization, therefore, additional authorization must be obtained prior to commencement of the proposed activity. This letter does not relieve you from the responsibility of obtaining other federal, state, or local authorizations that may be required for the activity. Please refer to the specific section(s) dealing with that portion of the review below for advice on how to proceed.

If you change the project from what you submitted, the authorization(s) granted may no longer be valid at the time of commencement of the project. Please contact us prior to beginning your project if you wish to make any changes.

1. Regulatory Review – Approved

Based on the forms, drawings, and documents revised with your notice, it appears that the project meets the requirements for the General Permit under Rule 62-330.453, F.A.C. Any activities performed under a general permit are subject to general conditions required in Rule 62-330.405, F.A.C. (attached), and the specific conditions of Rule 62-330.453, F.A.C. (attached). Any deviations from these conditions may subject the permittee to enforcement action and possible penalties.

Please be advised that the construction phase of the GP must be completed within five years from the date the notice to use the GP was received by the Department. If you wish to continue this GP beyond the expiration date, you must notify the Department at least 30 days before its expiration.

Authority for review- Part IV of Chapter 373, F.S., Title 62, F.A.C. and in accordance with the operating agreements executed between the Department and the water management districts, as referenced in Chapter 62-113, F.A.C.

2. Proprietary Review – Granted

The activity does not appear to be located on sovereign submerged lands, and does not require further authorization under Chapter 253 of the Florida Statutes, or Chapters 18-20 or 18-21 of the Florida Administrative Code.

3. Federal Review

3.1. SPGP Not Approved

Your proposed activity as outlined in your application and attached drawings **does not qualify** for Federal authorization pursuant to the State Programmatic General Permit VI-R1. **SEPARATE permit(s)** or authorization **may be required** from the U.S. Army Corps of Engineers and/or Florida Department of Environmental Protection. The activity, as proposed, does not involve discharge of dredged or fill material into the waters of the United States and therefore, **a SEPARATE PERMIT** or authorization pursuant to the State 404 Program, as described in Chapter 62-331, F.A.C. **will not be required**.

Authority for review - an agreement with the USACOE entitled "Coordination Agreement Between the U. S. Army Corps of Engineers (Jacksonville District) and the Florida Department of Environmental Protection (or Duly Authorized Designee), State Programmatic General Permit", Section 10 of the Rivers and Harbor Act of 1899, and Section 404 of the Clean Water Act.

3.2. Water Quality Certification Granted With Conditions

This permit also constitutes a *granted with conditions* water quality certification under Section 401 of the Clean Water Act, 33 U.S.C. Section 1341. Pursuant to Rule 62-330.062, F.A.C. State Water Quality Certification is granted when an activity meets all the terms and conditions of a

general permit under Rule 62-330.052, F.A.C., and the applicable Rules 62-330.401 through 62-330.635, F.A.C.

Additional Information

Please retain this general permit. The activities may be inspected by authorized state personnel in the future to ensure compliance with appropriate statutes and administrative codes. If the activities are not in compliance, you may be subject to penalties under Chapter 373, F.S., and Chapter 18-14, F.A.C.

NOTICE OF RIGHTS

This action is final and effective on the date filed with the Clerk of the Department unless a petition for an administrative hearing is timely filed under Sections 120.569 and 120.57, F.S., before the deadline for filing a petition. On the filing of a timely and sufficient petition, this action will not be final and effective until further order of the Department. Because the administrative hearing process is designed to formulate final agency action, the hearing process may result in a modification of the agency action or even denial of the application.

Petition for Administrative Hearing
A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. Pursuant to Rules 28-106.201 and 28-106.301, F.A.C., a petition for an administrative hearing must contain the following information:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name, address, any e-mail address, any facsimile number, and telephone number of the petitioner, if the petitioner is not represented by an attorney or a qualified representative; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination;

(c) A statement of when and how the petitioner received notice of the agency decision;

(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

(e) A concise statement of the ultimate facts alleged, including the specific facts that the petitioner contends warrant reversal or modification of the agency's proposed action;

(f) A statement of the specific rules or statutes that the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and

(g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wishes the agency to take with respect to the agency's proposed action.

The petition must be filed (received by the Clerk) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, or via electronic correspondence at Agency_Clerk@dep.state.fl.us. Also, a copy of the petition shall be mailed to the applicant at the address indicated above at the time of filing.

Time Period for Filing a Petition

In accordance with Rule 62-110.106(3), F.A.C., petitions for an administrative hearing by the applicant and persons entitled to written notice under Section 120.60(3), F.S., must be filed within 21 days of receipt of this written notice. Petitions filed by any persons other than the applicant, and other than those entitled to written notice under Section 120.60(3), F.S., must be filed within 21 days of publication of the notice or within 21 days of receipt of the written notice, whichever occurs first. You cannot justifiably rely on the finality of this decision unless notice of this decision and the right of substantially affected persons to challenge this decision has been duly published or otherwise provided to all persons substantially affected by the decision. While you are not required to publish notice of this action, you may elect to do so pursuant Rule 62-110.106(10)(a).

The failure to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C. If you do not publish notice of this action, this waiver will not apply to persons who have not received written notice of this action.

Extension of Time

Under Rule 62-110.106(4), F.A.C., a person whose substantial interests are affected by the Department's action may also request an extension of time to file a petition for an administrative hearing. The Department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, or via electronic correspondence at Agency_Clerk@dep.state.fl.us, before the deadline for filing a petition for an administrative hearing. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

Mediation

Mediation is not available in this proceeding.

FLAWAC Review

The applicant, or any party within the meaning of Section 373.114(1)(a) or 373.4275, F.S., may also seek appellate review of this order before the Land and Water Adjudicatory Commission under Section 373.114(1) or 373.4275, F.S. Requests for review before the Land and Water Adjudicatory Commission must be filed with the Secretary of the Commission and served on the

Department within 20 days from the date when this order is filed with the Clerk of the Department.

Judicial Review

Once this decision becomes final, any party to this action has the right to seek judicial review pursuant to Section 120.68, F.S., by filing a Notice of Appeal pursuant to Florida Rules of Appellate Procedure 9.110 and 9.190 with the Clerk of the Department in the Office of General Counsel (Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000) and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice must be filed within 30 days from the date this action is filed with the Clerk of the Department.

EXECUTION AND CLERKING

Executed in Hillsborough County, Florida.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Gerald Loesch

Gerald "J.J." Loesch
Environmental Administrator
Permitting & Waste Cleanup Program
Southwest District

Enclosures:
General Permit for Installation, Maintenance, Repair, and Removal of Utility Lines, 62-330.453, F.A.C.
General Conditions for All General Permits, Ch. 62-330.405, F.A.C.
Special Consent Conditions

Attachments:
1. Project drawings
2. Frac-Out Plan

Copies furnished to:

ERP Permitting, Southwest District, sw_erp@floridadep.gov
U.S. Army Corps of Engineers, tampareg@usace.army.mil
Kenneth Fraser, Jones Edmunds & Associates, Inc., kfraser@jonesedmunds.com

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this document and all attachments were sent on the filing date below to the following listed persons:

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to Section 120.52, F. S., with the designated Department Clerk, receipt of which is hereby acknowledged.

Cathy Rodriguez — December 21, 2023

Clerk **Date**

62-330.453 General Permit for Installation, Maintenance, Repair, and Removal of Utility Lines.

(1) A general permit is granted for the installation, maintenance, repair, and removal of underground utility lines, cable, conduit, or pipeline transmitting electricity, communication signals, potable water, raw water, reclaimed water, domestic wastewater, propane gas or natural gas.

(2) For the purposes of this general permit:

(a) "Directional drilling" means the linear or curvilinear excavation of a tunnel or conduit, in any direction, through the use of drilling equipment that can change direction during excavation; this also includes borehole reaming and pulling following primary drilling.

(b) "Jack-and-bore" means the linear, primarily lateral excavation of a tunnel, typically between excavated subgrade pits, through use of drilling equipment and encasement which is advanced under mechanical force, and includes similar methods commonly termed as "microtunneling."

(c) "Frac-out" means any release of drilling fluid or slurry which results in above-grade discharge of drilling fluid or slurry or significant loss of such fluid or slurry into the surrounding parent material.

(3) This general permit is limited as follows:

(a) No work occurs within Outstanding Florida Waters, Aquatic Preserves, or Class I waters.

(b) The installation of conduit or pipeline to drain wetlands or other surface waters is not authorized.

(c) Prior to work, existing pipelines shall be evacuated of substances which, if released, could result in a violation of state water quality standards.

(d) The maximum width of the disturbed corridor in wetlands shall not exceed 30 feet.

(e) The total area of forested wetland disturbance shall not exceed 0.5 acre per ten miles of cable, conduit, or pipeline.

(f) Minor above-grade improvements may be constructed in uplands under this general permit, but shall be limited to vents, valves, meter assemblies, relays, junction boxes, pads or similar structures that are directly connected to the utility line, do not create discharges, and which cumulatively comprise no more than 100 square feet of impervious surfaces per mile of utility line.

(g) Installation, maintenance, repair, and removal activities performed via trenching or methods other than directional drilling or jack-and-bore, are subject to the following special conditions:

1. The maximum width of the excavated trench shall not exceed eight feet, with temporary spoil storage banks not to exceed ten feet in width;

2. For a trench with a top width greater than three feet in herbaceous wetlands, the upper layer of the soil horizon shall initially be scraped and segregated into a spoil bank that is separated from the spoil bank resulting from the excavation of the trench for the utility line. The upper layer of the soil horizon shall be replaced as the last step of restored grades to facilitate natural revegetation;

3. Trenching in surface waters shall be limited to wetlands, artificial waters, and residential canal systems; and

4. Temporary spoil banks shall contain breaches that prevent impoundment or restriction of surface water flows;

(h) Installation, maintenance, repair, and removal conducted using directional drilling or jack-and-bore methods are subject to the following special conditions:

1. The maximum outside diameter of the cable, conduit or pipeline, including encasement, shall not exceed 30 inches.

2. A minimum depth of cover, equal to the greater of either five feet, or five times the maximum encased diameter of the utility line to be installed, shall be maintained between the top of the utility line and casing and the soil surface or submerged bottom of any wetland or waterbody being crossed.

3. All work areas associated with directional drilling or jack-and-bore activities, including entrance and exit pits, drill rigs, tanks, pumps, drilling fluid mixing and settling pits, dewatering systems and staging areas for pipe, cables, and drill string, shall be located within uplands.

4. The use of drilling fluids shall not cause or contribute to a violation of state ground water quality criteria or standards, as defined in chapter 62-520, F.A.C.

5. The permittee shall, at least 48 hours prior to commencement of any directional drilling or jack-and-bore activities, submit to the agency the name, as registered with the Florida Department of State, and all-hours telephone contact information of all contractors responsible for drilling and for containment and cleanup in the event of a drilling fluid frac-out or spill.

6. The contractor shall, at all times during directional drilling activities, maintain appropriate equipment and materials in a readily-accessible location and condition, to effectively contain and clean up a drilling fluid frac-out or spill.

7. The permittee or the permittee's contractor shall, at all times during directional drilling activities, ensure that appropriately-trained personnel monitor downhole equipment position, drilling fluid circulation and pressures, and actively monitor the entire utility line route for surface frac-out of drilling fluids.

8. Drilling activities shall be discontinued and the drilling fluid or slurry shall be contained using appropriate methods as soon as possible, in the event of a drilling fluid frac-out or spill. Removal of drilling fluid or slurry from wetlands and other surface waters shall be initiated and completed in the most expeditious manner practicable. Removed drilling fluid shall be contained or disposed of in an appropriate upland location. Any frac-out or spill of drilling fluid into wetlands or other surface waters shall be reported to Agency staff within 24 hours following detection of the spill or frac-out.

(i) Utilities must be located a minimum of 14 feet below the authorized depth of a federal navigation channel.

Rulemaking Authority 373.026(7), 373.043, 373.118(1), 373.406(5), 373.4131, 373.414(9), 373.418, 403.805(1) FS. Law Implemented 373.118(1), 373.406(5), 373.413, 373.4131, 373.414(9), 373.416, 373.418, 403.814(1) FS. History–New 10-3-95, Formerly 62-341.453, Amended 10-1-13, 6-1-18.

62-330.405 General Conditions for All General Permits

The following general permit conditions are binding upon the permittee and are enforceable under chapter 373, F.S. These conditions do not apply to the general permit for stormwater management systems under section 403.814(12), F.S.

(1) The general permit is valid only for the specific activity indicated. Any deviation from the specified activity and the conditions for undertaking that activity shall constitute a violation of the permit and may subject the permittee to enforcement action and revocation of the permit under

chapter 373, F.S.

(2) The general permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any construction, alteration, operation, maintenance, removal or abandonment authorized by this permit; and it does not authorize any violation of any other applicable federal, state, local, or special district laws (including, but not limited to, those governing the "take" of listed species).

(3) The general permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the general permit.

(4) The general permit does not relieve the permittee from liability and penalties when the permitted activity causes harm or injury to: human health or welfare; animal, plant or aquatic life; or property. It does not allow the permittee to cause pollution that violates state water quality standards.

(5) Section 253.77, F.S., provides that a person may not commence any excavation, construction, or other activity involving the use of state-owned or other lands of the state, the title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund without obtaining the required consent, lease, easement, or other form of authorization authorizing the proposed use. Therefore, the permittee is responsible for obtaining any necessary authorizations from the Board of Trustees prior to commencing activity on state-owned lands.

(6) The authorization to conduct activities under a general permit may be modified, suspended or revoked in accordance with chapter 120, F.S., and section 373.429, F.S.

(7) The general permit is not transferable to a new third party. To be used by a different permittee, a new notice to use a general permit must be submitted in accordance with rule 62-330.402, F.A.C. Activities constructed in accordance with the terms and conditions of a general permit are automatically authorized to be operated and maintained by the permittee and subsequent owners in accordance with subsection 62-330.340(1), F.A.C. Any person holding the general permit, persons working under the general permit, and owners of land while work is conducted under the general permit shall remain liable for any corrective actions that may be required as a result of any permit violations prior to sale, conveyance, or other transfer of ownership or control of the permitted project, activity, or the real property at which the permitted project or activity is located.

(8) Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the permitted system to ensure conformity with the plans and specifications approved by the general permit.

(9) The permittee shall maintain any permitted project or activity in accordance with the plans submitted to the Agency and authorized in the general permit.

(10) A permittee's right to conduct a specific activity under the general permit is authorized for a duration of five years.

(11) Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be implemented and maintained immediately prior to, during, and after construction as needed to stabilize all disturbed areas, including other measures specified in the permit to prevent adverse impacts to the water resources and adjacent lands. Erosion and sediment control measures shall be installed and maintained in accordance with the *State of Florida Erosion and Sediment Control Designer and Reviewer Manual (Florida Department of Environmental*

Protection and Florida Department of Transportation, June 2007), available at https://www.flrules.org/Gateway/reference.asp?No=Ref-04227, and the *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008)*, available at http://publicfiles.dep.state.fl.us/DEAR/Stormwater_Training_Docs/erosion-inspectors-manual.pdf.

(12) Unless otherwise specified in the general permit, temporary vehicular access within wetlands during construction shall be performed using vehicles generating minimum ground pressure to minimize rutting and other environmental impacts. Within forested wetlands, the permittee shall choose alignments that minimize the destruction of mature wetland trees to the greatest extent practicable. When needed to prevent rutting or soil compaction, access vehicles shall be operated on wooden, composite, metal, or other non-earthen construction mats. In all cases, access in wetlands shall comply with the following:

(a) Access within forested wetlands shall not include the cutting or clearing of any native wetland tree having a diameter four inches or greater at breast height;

(b) The maximum width of the construction access area shall be limited to 15 feet;

(c) All mats shall be removed as soon as practicable after equipment has completed passage through, or work has been completed, at any location along the alignment of the project, but in no case longer than seven days after equipment has completed work or passage through that location; and

(d) Areas disturbed for access shall be restored to natural grades immediately after the maintenance or repair is completed.

(13) Barges or other work vessels used to conduct in-water activities shall be operated in a manner that prevents unauthorized dredging, water quality violations, and damage to submerged aquatic communities.

(14) The construction, alteration, or use of the authorized project shall not adversely impede navigation or create a navigational hazard in the water body.

(15) Except where specifically authorized in the general permit, activities must not:

(a) Impound or obstruct existing water flow, cause adverse impacts to existing surface water storage and conveyance capabilities, or otherwise cause adverse water quantity or flooding impacts to receiving water and adjacent lands; or

(b) Cause an adverse impact to the maintenance of surface or ground water levels or surface water flows established pursuant to section 373.042, F.S., or a Works of the District established pursuant to section 373.086, F.S.

(16) If prehistoric or historic artifacts, such as pottery or ceramics, projectile points, stone tools, dugout canoes, metal implements, historic building materials, or any other physical remains that could be associated with Native American, early European, or American settlement are encountered at any time within the project site area, the permitted project shall cease all activities involving subsurface disturbance in the vicinity of the discovery. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance Review Section (DHR), at (850)245-6333, as well as the appropriate permitting agency office. Project activities shall not resume without verbal or written authorization from the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and the proper authorities notified in accordance with section 872.05, F.S.

(17) The activity must be capable, based on generally accepted engineering and scientific principles, of being performed and of functioning as proposed, and must comply with any

applicable District special basin and geographic area criteria.

(18) The permittee shall comply with the following when performing work within waters accessible to federally- or state-listed aquatic species, such as manatees, marine turtles, smalltooth sawfish, and Gulf sturgeon:

(a) All vessels associated with the project shall operate at "Idle Speed/No Wake" at all times while in the work area and where the draft of the vessels provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.

(b) All deployed siltation or turbidity barriers shall be properly secured, monitored, and maintained to prevent entanglement or entrapment of listed species.

(c) All in-water activities, including vessel operation, must be shut down if a listed species comes within 50 feet of the work area. Activities shall not resume until the animal(s) has moved beyond a 50-foot radius of the in-water work, or until 30 minutes elapses since the last sighting within 50 feet. Animals must not be herded away or harassed into leaving. All onsite project personnel are responsible for observing water-related activities for the presence of listed species.

(d) Any listed species that is killed or injured by work associated with activities performed shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1(888)404-3922 and ImperiledSpecies@myFWC.com.

(e) Whenever there is a spill or frac-out of drilling fluid into waters accessible to the above species during a directional drilling operation, the FWC shall be notified at ImperiledSpecies@myfwc.com with details of the event within 24 hours following detection of the spill or frac-out.

(19) The permittee shall hold and save the Agency harmless from any and all damages, claims, or liabilities which may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any activity authorized by the general permit.

(20) The permittee shall immediately notify the Agency in writing of any submitted information that is discovered to be inaccurate.

Rulemaking Authority 373.026(7), 373.043, 373.118(1), 373.406(5), 373.4131, 373.414(9), 373.4145, 373.418, 403.805(1) FS. Law Implemented 373.044, 373.118(1), 373.129, 373.136, 373.406(5), 373.413, 373.4131, 373.414(9), 373.4145, 373.416, 373.422, 373.423, 373.429, 403.814(1) FS. History–New 10-3-95, Amended 10-1-07, Formerly 62-341.215, Amended 10-1-13, 6-1-18.

General Conditions for All Projects:

1. The time limit for completing the work authorized ends on July 27,2026.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while

accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and State coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner on the enclosed form (Attachment 10) and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Further Information:

1. Limits of this authorization.

   a. This permit does not obviate the need to obtain other Federal, State, or local authorizations required by law.

   b. This permit does not grant any property rightsor exclusive privileges.

   c. This permit does not authorize any injury to the property or rights of others.

   d. This permit does not authorize interference with any existing or proposed Federal projects.

2. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

   a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

   b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by oron behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or Construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

3. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

4. Reevaluation of Permit Decision: This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 3 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

5. Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CER 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date the enclosed form.

7. The Permittee understands and agrees that, if future operations by the United States

require the removal, relocation, or other alteration, of the structures or work herein authorized, or if, in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the Permittee will be required, upon due notice from the U.S. Army Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal, relocation or alteration.

HORIZONTAL DIRECTIONAL DRILLING FRAC-OUT PLAN

1 INTRODUCTION

Horizontal directional drilling (HDD) is a trenchless pipeline installation method that is accomplished in three phases. The initial phase involves drilling a small-diameter pilot hole along a predetermined path. The second phase involves enlarging the pilot hole to a size suitable for the selected pipe. The third phase involves pulling the selected pipe through the borehole. All phases use drilling fluids, which generally consist of a mixture of fresh water, bentonite clay, and non-hazardous polymer additives.

The primary purposes of the drilling fluid during drilling operations are the following:

- Hydraulic cutting of soils by use of high-velocity jets in the drill bits.
- Lubricating, cooling, and cleaning of the drilling cutters.
- Transporting of soil cuttings and spoil by suspension in the fluid as it returns from the cutting head through the borehole to the surface at the entry or exit pits.
- Stabilizing the borehole against collapse and minimizing fluid loss to surrounding soils.
- Reducing friction during pullback of the selected pipe through the borehole.

The inadvertent return of the drilling fluids, also known as frac-out, occurs when the drilling fluid follows the path of least resistance and does not return as intended to the containment pits but rather to other areas along the HDD alignment. Although drilling fluid and pumping parameters can be adjusted to reduce the risk of frac-outs, they cannot be eliminated. The inadvertent return of fluids typically occurs near the HDD entry and exit points where the drill head is shallow. However, a frac-out during drilling operations can occur at any point along the route. The following can increase the risk of frac-outs:

- Highly permeable soils such as gravel.
- Soils consisting of loose sands or very soft clays.
- Clay soils that tend to swell in the presence of fluids.
- Considerable elevation differences between the entry or exit points and ground elevations along the HDD alignment.
- Disturbed soils such as fill or in soils adjacent to piles or other structures.
- Shallow sections along the HDD alignment.
- Locations along the HDD alignment where significant variations in density and/or composition of ground conditions are encountered (i.e., overburden/bedrock contact and other types of mixed-interface transition zones).
- Inappropriate downhole tooling or drilling practices.

Drilling fluid is classified as non-toxic to the aquatic environment and is a non-hazardous substance. Drilling fluids that are released typically contain a lower concentration of bentonite when they surface because the bentonite is filtered out as it passes through existing soils and sediment layers. However, if released to water bodies, the bentonite has a potential to adversely impact fish and invertebrates. The use of drilling fluids shall not cause

or contribute to a violation of state ground water quality criteria or standards, as defined in chapter 62-520, F.A.C.

2 PURPOSE

This HDD Frac-Out Plan establishes specific operational procedures and responsibilities for the prevention, containment, and cleanup of the inadvertent returns associated with each drilling installation. The Contractor shall adhere to this Frac-Out Plan, and each HDD installation shall be in accordance with the Contract Documents. The Contractor is solely responsible for the successful installation of each pipe by HDD and shall analyze each installation and make modifications as necessary to successfully install each pipe.

The overall objectives of this plan are to:

- Minimize the potential for frac-out associated with HDD activities.
- Provide best management practices (BMPs) consisted with Florida Department of Environmental Protection (FDEP) and applicable regulatory guidelines.
- Provide methods for timely identification and detention of frac-outs.
- Ensure an organized, timely response to ensure that minimal environmental impacts occur in the event of a frac-out.
- Ensure that all notifications are made immediately to the project owner, engineer, regulatory agencies, and safety personnel.

3 BEST MANAGEMENT PRACTICES

The Contractor will implement the following BMPs to minimize the potential for adverse environmental impacts during HDD activities:

1. The permittee shall, at least 48 hours prior to commencement of any directional drilling vactivities, submit to the agency the name, as registered with the Florida Department of State, and all-hours telephone contact information of all contractors responsible for drilling and for containment and cleanup in the event of a drilling fluid frac-out or spill.
2. BMPs for erosion control within the staging area shall be implemented at the start of Contractor mobilization and maintained at all times especially during the drilling, over-reaming, and utility pipe pull-in operations to prevent off-site siltation and turbid discharges in excess of State Water Quality Standards pursuant to Rule 62-302, Florida Administrative Code (FAC). BMP methods shall include but are not limited to the immediate placement of turbidity containment devices such as turbidity screens, silt containment fences, hay bales, sand bags, earth and stone berms, temporary containment swales, etc. to contain the drilling fluid. Earth berms or swales shall not be used where they may impact wetlands or other surface waters.
3. Drilling fluids for the HDD shall be a project-specific homogenous mixture of nontoxic, non-environmentally hazardous, bentonite clay, potable water, and polymer additive(s). All bentonite clay and polymer additives/stabilizing agents shall be preapproved by the Owner and Engineer.

4 PREVENTION OF FRAC-OUT SPILL

To provide an additional level of environmental protection, the following measures shall be taken to monitor any potential releases of drilling fluid:

1. The appropriate boring depth for the soil conditions shall be maintained along the drilling route and drilling fluid circulation pressures shall be properly managed.
2. Drilling fluid returns (flow of drilling fluids to the HDD entry/exit pit) shall be continuously visually monitored during the installation.
3. The volume and circulation pressure of drilling fluid shall be continuously monitored during the HDD operation. The HDD drill rig operator will monitor the downhole annular pressure at all times. Should a drop in volume occur, a visual inspection along the HDD corridor shall immediately be conducted. The visual inspection shall also include observation of adjacent waterbodies, wetlands, and drainage systems.
4. All drilling fluids associated with the HDD operation shall be contained onsite. The volume of the drilling fluids recirculation/solids settlement pit and onsite storage/frac tanks and watertight roll-off containers shall be determined by the Contractor and discussed with the Owner and Engineer before initiating each HDD. As required during the HDD process, screened solids and surplus drilling fluid shall be removed and disposed of off the project site at a location of the Contractor's choice in accordance with applicable regulations. At the conclusion of all drilling operations, drilling fluid remaining in the pit will be settled, removed completely from the entry and exit pits, and hauled to a disposal site of the Contractor's choice in accordance with applicable regulations within 48 hours of the pipe pull-in. The entry and exit pits will be backfilled and the disturbed pipe areas restored in accordance with the Contract Documents.
5. Adequate protection will be taken at all times to avoid impacts to wetlands, waterways, endangered species or habitats, existing infrastructure within public rights-of-way, and private property. This will include limiting or halting of construction or drilling activities and environmental protection measures such as erosion and sediment control devices.
6. A pump tanker or vacuum truck will be onsite and available at all times. The Contractor shall demonstrate to the Owner and Engineer that the contracted availability of additional pump tankers and/or vacuum trucks is needed for surplus or frac-out drilling fluids.
7. A drilling fluid spill kit will be onsite and available at all times. The kit will include but not be limited to absorbent pads, brooms, and shovels as well as personal protective equipment including but not limited to goggles and gloves.

5 RELEASE RESPONSE PROCEDURE

If the bore pressure is observed to be abnormally high or fluid loss is apparent and a release has occurred, the Contractor has the following options (or any combination of these options):

- Temporarily cease drilling operations and shut down the mud pump delivering drilling fluids downhole.

- Restart the pump and stroke the borehole in 30-foot (+/-) lengths to restore circulation ("swab" the hole) as many as six times but no fewer than two times.
- Introduce additional flow along the borehole starting at the entry/exit using "weeper" subs.
- Modify the drilling mud with a change in viscosity and/or lost circulation additives.

If the return drilling fluid is less than the projected amount to be recovered, the HDD Contractor shall immediately begin its search for the missing material by visually inspecting the HDD corridor, which includes inspection of adjacent waterbodies, wetlands, and drainage systems. Once the drilling fluid and frac-out is located, the drilling mud containment plan shall be immediately implemented.

If a frac-out is confirmed, all construction activity associated with the drilling shall cease immediately and the Contractor shall notify the Owner and Engineer of the confirmed occurrence. The notification should include a description and time of the frac-out, location, and the current environmental conditions of any impacted area.

If the frac-out is observed during pullback of the force main, the following procedures will be followed:

- The Contractor will implement all drilling fluid containment measures before continuing pullback.
- The Contractor will ensure that all reasonable measures within the limitations of current technology have been taken to re-establish circulation.
- The Contractor shall continue the HDD using a minimal amount of drilling fluid as required to penetrate the formation or to maintain a successful utility pipe pullback.

If the loss of drilling fluid or excess fluid pumping/recirculation pressure results in the heaving and/or settlement of pavement, curb, sidewalk and/or other infrastructure, the Contractor shall immediately mobilize all equipment, labor, and devices to recover the drilling fluid, relieve the fluid pressure, stop any heaving or settlement of infrastructure, and protect the public. The Contractor will prepare a remediation plan to repair, replace, or restore the affected infrastructure in accordance with the Contract Documents for approval by the Owner, Engineer, or right-of-way owner before implementation.

Before continuing with the HDD operation, the Contractor will prepare and submit for Owner and Engineer approval a revised HDD plan for successful completion of the required project. The plan shall identify the labor, equipment, drilling fluid, additives, pump pressures, original bore-hole sealing, and bore-path modifications that may be required.

6 CONTAINMENT

The released drilling fluid and materials shall be contained using methods in the BMPs. The materials shall be removed by a pump or vacuum truck.

The suction hose of the vacuum or pump shall be maneuvered and controlled to minimize the removal of natural bottom material and the disturbance of aquatic life and vegetation in any impacted body of water. If drilling fluids/materials are discharged to a surface water, containment and clean-up with a vacuum or pumping system will commence immediately

and be completed within a 24-hour period. The collected fluid/material will be disposed of by the Contractor at an approved disposal site. In this event, the HDD Contractor shall prepare a written report to be submitted to the Owner, Engineer, and applicable regulatory agencies within 10 business days, which summarizes the events that occurred. This summary should include the following:

- Details regarding the event, including an estimate on the gallons of drilling fluid released and the amount of drilling fluid recovered.
- Time, date, and location of the release.
- The size of the area impacted.
- The level of success of the clean-up activities.
- Name, company, address, and telephone number of the Contractor.
- Photograph/video of frac-out area and impacts.
- The type of activity that was occurring around the area of the inadvertent release.
- Description of any environmentally sensitive areas and their location in relation to the inadvertent release.
- Description of the methods used to clean up or secure the site.
- Changes to the drilling fluid properties or drilling process (if any) and the mitigation of any public utility infrastructure and water bodies from the frac-out.

7 CLEAN-UP

After completing the HDD installation, the Contractor shall develop site-specific clean-up measures for approval by the Owner and Engineer. The potential for secondary impact from the clean-up process will be evaluated together with the benefits of clean-up activities.

The following measures should be considered:

- All materials and construction debris will be removed at the end of each workday.
- Drilling mud will be removed using shovels, buckets, and soft-bristled brooms to minimize damage to existing vegetation.
- Freshwater washes may be used if determined to be beneficial and necessary.
- Containment structures will be pumped out and the ground surface scraped to bare topsoil to minimize the loss of topsoil or negative effects to adjacent vegetation.
- The recovered drilling fluid will be recycled or disposed of at an approved upland location or disposal facility. No recovered drilling fluids will be disposed of in waterbodies, wetlands, storm drains, or any environmentally sensitive areas.
- All protective BMP measures including hay bales, silt fences, and turbidity barriers will be removed unless otherwise specified by the Owner or Engineer.
- All containment structures, containers, and tanks will be removed.

8 FAILED INSTALLATION

While not expected, if an attempted HDD installation is unsuccessful, the proposed HDD alignment may be modified using the same general location along a revised bore path that is approved by the Owner and Engineer and is in accordance with all applicable regulatory requirements.

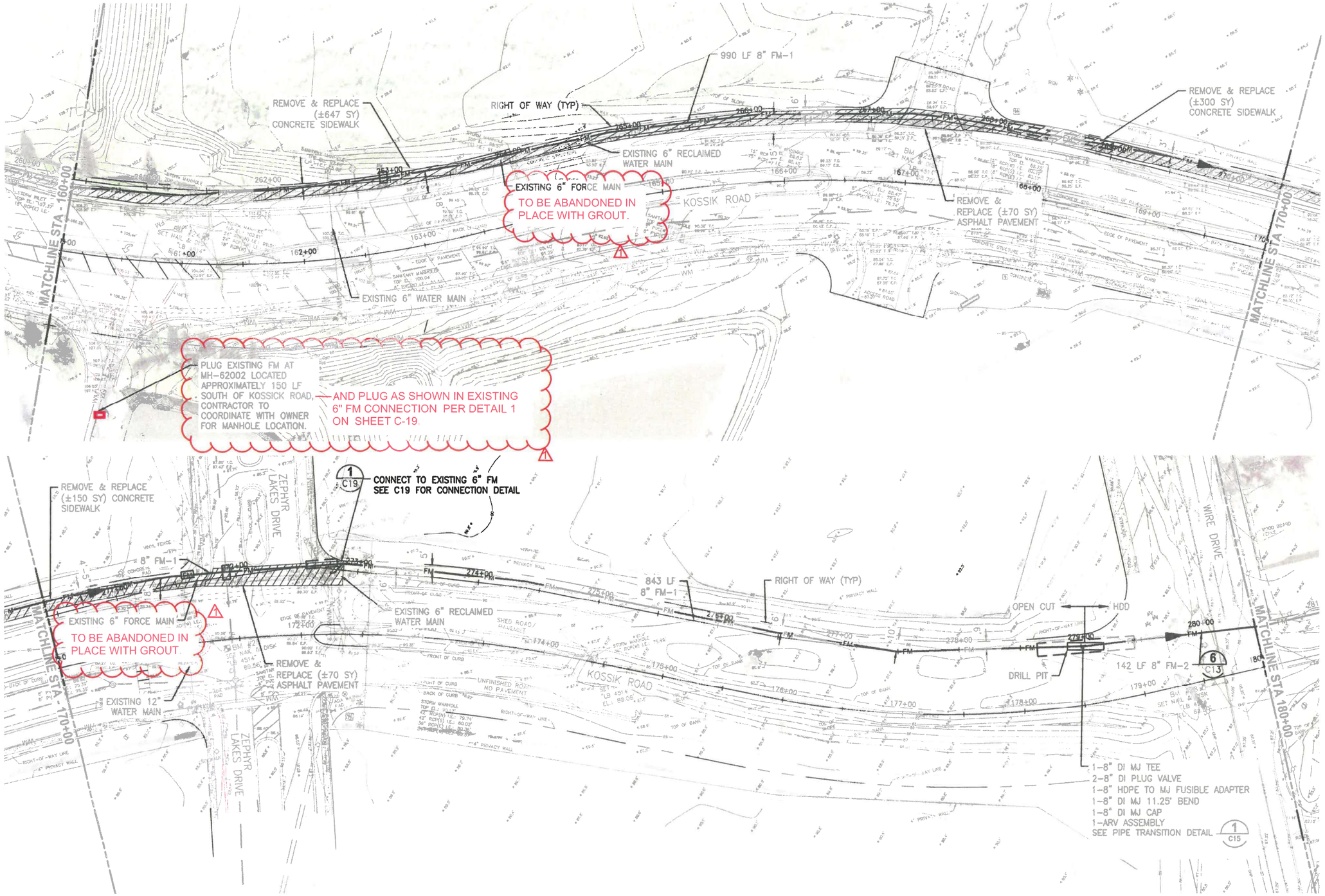
Before attempting a second HDD installation, a meeting will be held with the Owner and Engineer to determine the cause of the initial failure and any mitigation measures that could be adopted to reduce the risk(s) during the second HDD installation.

Potential causes that may lead to a failed HDD installation include:

1. Stuck or damaged utility pipe during pullback operations. This risk may be mitigated by:
    a. Completing a swab pass or passes to gauge the condition of the HDD bore by evaluating the drill rig effort required to pull tooling through the HDD bore.
    b. Only commencing pullback operations after verifying that the bore is adequately conditioned.
    c. Minimizing the amount of downtime associated with delays during pullback operations.
2. Bore instability/collapse. This risk may be mitigated by confirming that the alignment of the HDD profile is in favorable ground materials along the alignment and that are not amenable to raveling causing collapse of the bore.
3. Excess loss of drilling fluids and the inability to remove cuttings from the bore. This risk is mitigated by:
    a. Confirming that the alignment of the HDD profile is in favorable ground materials along the alignment.
    b. Evaluating the required and allowable drilling fluid pressures for the installation and providing sufficient separation between the required and allowable drilling fluid pressures.
    c. Incorporating temporary casing pipe to support shallow soils.

If the HDD bore could not be advanced and abandonment is required, the borehole will be grouted with an approved cement-based or bentonite material to fill the excavation and minimize risks of a potential groundwater flow pathway starting at the low point or end of the drill hole in accordance with Rule 62-532.500(4), FAC.

If an HDD installation is completed and the installed utility pipe is damaged so that it cannot be used for its intended purpose, the inside of the utility pipe shall be grouted with a cement-based grout and the annular space around the pipe grouted for approximately 200 feet at each HDD entry and exit location. This approach is outlined in the US Army Corps of Engineers' *Guidelines for Installation of Utilities Beneath Corps of Engineers Levees Using Horizontal Directional Drilling* (Latorre et al. 2002) that requires backfilling with grout or bentonite. Any additional requirements detailed in permits for this HDD installation will be met in terms of abandonment.



LTR.	DATE	REVISIONS	BY	APPRD.
2	12/28/23	ADDENDUM 2	GSF	KF

DESIGNED K. FRASER
DRAWN S. SIMS
CHECKED D. PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

KOSSIK RD PLANVIEW

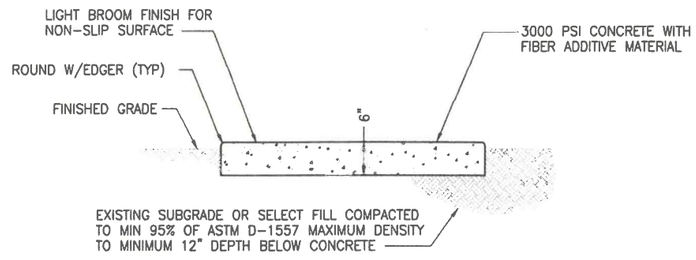
THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH A. FRASER, PE #57452 ON THE DATE SHOWN ON THE COVER SHEET.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

PROJECT NO:	DATE:
26110-053-01	NOV. 2023
INDEX NO:	DWG NO: C8

BID DOCUMENTS

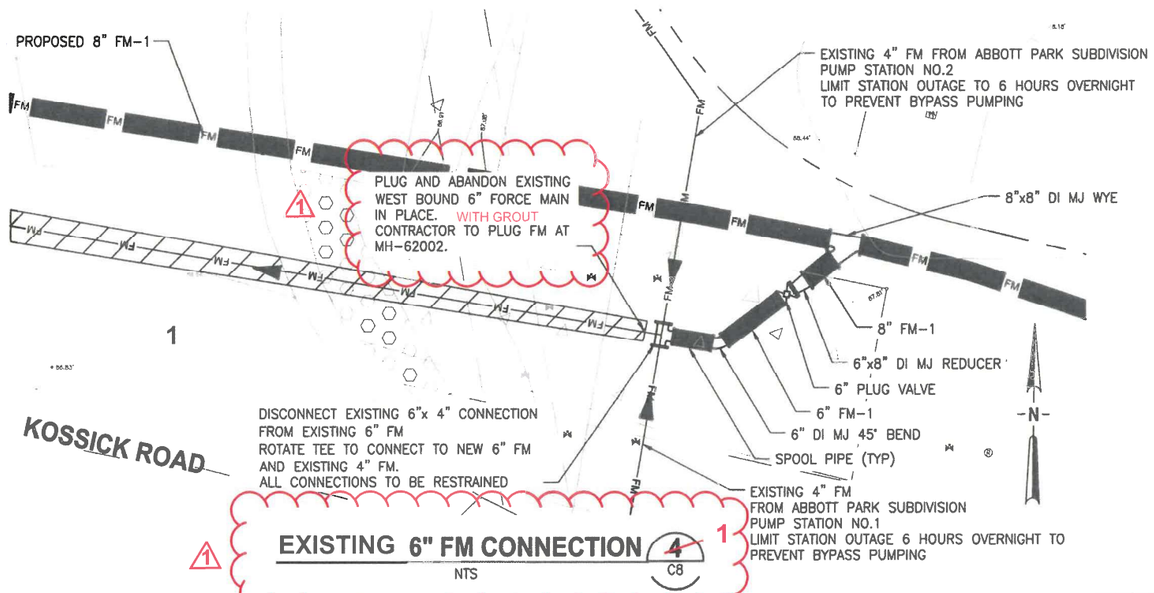
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NOTE:
SIDEWALK JOINTS SHALL BE PER FDOT INDEX 310.

CONCRETE RAMP AND SIDEWALK DETAIL 3 / –

NTS



EXISTING 6" FM CONNECTION 4 / C8

NTS

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.
1	12/28/23	ADDENDUM 2	GSF	KF

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

NORTHSIDE PHASE 3 FORCE MAIN \ WATER LINE EXTENSION

CIVIL DETAILS

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PROJECT NO: 26110-053-01
DATE: NOV. 2023
INDEX NO:
DWG NO: C19

SAVED: 9/29/2023 3:30 PM KFRASER Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\053-01 NORTH SIDE LS PHASE 3\DESIGN&CONSTRUCTION\CAD\DWGS\CIVIL\26110053O1-C17.DWG

BASE BID

Item 1. Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions (not to exceed 5% of the Base Bid)—This item shall include and cover the costs for performing construction; preparatory and overhead operations including but not limited to movement of personnel and equipment to and from the site; sanitary facilities; project administration and management; insurance; Owner and Engineer indemnification; temporary utilities; permits related to construction; performance and payment bonds in accordance with Florida Statutes 225.05; site safety and health program during the execution of the Construction Contract that complies with all local, state, and federal safety guidelines and laws; and all other similar activities and facilities necessary for executing this project. This lump-sum item shall not exceed 5% of the Base Bid amount. The Contractor will be paid 20% of this item upon completion of mobilization and 10% upon demobilization; the remainder will be prorated equally over the construction period.

Item 2. Traffic Control—The Contractor shall furnish all labor, signage, barricades, and other equipment necessary to provide traffic control in accordance with the Florida Department of Transportation (FDOT) Standard Specifications for all phases of work and all other maintenance of traffic plans as may be required by local, county, or state agencies. The Contractor will be paid 40% of this lump-sum item upon delivery and set up of the materials, and the remainder will be prorated equally over the construction duration.

Item 3. Environmental Protection—This item shall include but not be limited to all costs for providing a comprehensive environmental protection program for the project site and other areas as may be affected by the construction. This includes providing labor and materials necessary to prevent environmental damage to the ground, water, and air in conformance with all local, state, and federal laws. Examples include control of stormwater, erodible soils, noise, dust, pollutants, trash, waste, pumping discharge, and any other substance or activity that may adversely impact the environment. The Contractor will be paid 40% upon delivery and set up of the materials, and the remainder will be prorated equally over the construction period.

Item 4. Construction Survey and Layout—This item shall include all costs for providing the services of a Professional Land Surveyor to perform pre-construction stakeout; establish vertical control; and establish horizontal control, right-of-way locations, property boundary locations, and Record Drawing information verification and certification in accordance with the Contract Documents and to the satisfaction of the Owner. The Contractor will be paid 40% of this lump-sum item upon initial project layout, and the remainder will be prorated equally over the duration of construction.

Item 5. 6-Inch, 8-inch Sanitary Sewer Force Main via Open-Cut—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 6-inch and 8-inch sanitary sewer force mains installed by open cut as shown on the Drawings in accordance with the Contract Documents, including but not limited to provide vacuum trucks and/or pumps/pipe/fittings for bypass pumping of sewer flow during force main connections, and

grout filling of all existing piping designed to be abandoned in place, all polyvinyl chloride (PVC) pipe, ductile iron (DI) pipe, DI fittings and connections, pipe restraints, end plugs, tracing wire, flushing of all lines, connections, excavation, backfill, compaction, sodding/seeding, pressure testing, all associated appurtenances, and any other incidentals necessary for a complete and operable system as designed. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 6. 6-Inch, 8-inch Sanitary Sewer Force Main via Horizontal Directional Drilling (HDD)—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 6-inch and 8-inch sanitary sewer force main via HDD as shown on the Drawings in accordance with the Contract Documents, including but not limited to bore pits, piping, boring, reaming, back-reaming, slurry, slurry relief holes, installing the pipe in the bore, connections and transition couplings, high-density polyethylene (HDPE) reducers, HDPE fittings, removing or avoiding obstructions in the path of the HDPE pipe, existing utility coordination and relocation, excavation, backfill, compaction, sodding/seeding, site restoration, pressure testing, disinfection, disposal of soil (including disposal of soil/slurry mixture), and all associated appurtenances. Concrete, asphalt, or limerock repairs required specifically for the HDD installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 7. 12-Inch Potable Water Main via Open-Cut—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 12-inch potable water main via open-cut as shown on the Drawings in accordance with the Contract Documents, including but not limited to all PVC pipe, DI fittings and connections, pipe restraints, end plugs, fire hydrants, tracing wire, flushing of all lines, connections, excavation, backfill, compaction, sodding/seeding, landscape restoration, mailbox and other improvements restoration, existing utility coordination and relocation, pressure testing, bacteriological testing, all associated appurtenances, and any other incidentals necessary for a complete and operable system as designed. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe. No deduction in length will be made for the space occupied by valves or fittings. Concrete, asphalt, or limerock repairs required specifically for the open-cut water main installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid on a unit-price basis for each linear foot of water main installed complete as measured in place.

Item 8. Combination Air/Vacuum Valves and Vaults—The Contractor shall furnish and install all labor, materials, equipment, and services for constructing and placing into operation combination air/vacuum valves and vaults as shown on the Drawings in accordance with the Contract Documents, including but not limited to combination air/vacuum valves, pipe saddles, corporation stops, pipe, fittings, isolation valves, gravel bedding, valve boxes, valve manholes

NORTHSIDE LIFT STATION –
WATER/ WASTEWATER FORCE MAIN - PHASE 3
CITY OF ZEPHYRHILLS

City Bid No. ITB 2023-02
Jones Edmunds Project No. 26110-053-01

ADDENDUM NO. 3

December 29, 2023

BIDS DUE: 10:00 AM, Local Time, January 12, 2024

TO ALL CONTRACTORS BIDDING ON THIS PROJECT:

The changes, additions, substitutions, and/or deletions contained in Addendum No. 3 are hereby made part of the Contract Documents fully and completely for the construction of the City of Zephyrhills Northside Lift Station, Water / Wastewater Force Main, Phase 3, Jones Edmunds & Associates, Inc., Project No. 26110-053-01, for the City of Zephyrhills, dated December 2023.

Bidders Question:

1. Is there tree removal on this project? If so, do you have an quantity of tree removal?

1. **City / Engineer's Response:**
   The project is anticipated to have minimum tree removal. In the event that trees are identified to be removed for construction, these will be handled on a case-by-case basis.

Bidders Question:

2. Can the section that runs through the easement where the owner have taken over that land for farming be directionally drilled instead of open cut as shown? There are no service connections going in there and it seems that limiting the tree clearing and not disturbing the homeowners would be a more ideal option.

2. **City / Engineer's Response:**
   This alternative along with any others that have been identified by the Contractor can be discussed with the City / Engineer at the Pre-Construction Meeting.

END OF ADDENDUM

Reference was made to the language located in the Technical Specifications, Section 01100, Summary of Work, Part 1, Section 1.07 Reimbursement Fees in which "Supplementary Conditions" were referred to.

Supplementary Conditions referenced in this section do not apply to this project.

US Water Services Corporation Proposal

Pricing unsealed at Jan 12, 2024 10:00 AM

CONTACT INFORMATION

Company
US Water Services Corporation

Email
ccrego@uswatercorp.net

Contact
Christina Crego

Address
4939 CROSS BAYOU BOULEVARD
New Port Richey FL 34652
NEW PORT RICHEY, FL 34652

Phone
(727) 848-8292 Ext: 222

Website
www.uswatercorp.com

Submission Date
Jan 12, 2024 9:50 AM

ADDENDA CONFIRMATION

Addendum #1
Confirmed Dec 29, 2023 2:26 PM by Christina Crego

Addendum #2
Confirmed Dec 29, 2023 2:26 PM by Christina Crego

Addendum #3
Confirmed Dec 29, 2023 2:26 PM by Christina Crego

Addendum #4
Confirmed Jan 9, 2024 10:40 AM by Christina Crego

QUESTIONNAIRE

1. Respondent Submittals (without Cost)* ☐ Pass ☐ Fail

Please Upload your COMPLETE response, including any and all required forms listed in the solicitation and the corresponding attachments.

(Do not upload cost information in here)

3.1._Page_22,_Signed_and_Notarized--In_Response_(signed).pdf

3.2._Bid_Bond_(signed).pdf

3.3._Public_Entity_Crimes_(signed).pdf

3.4._E-Verify_Certification_Form_(signed).pdf

3.5._Addenda_Acknowledgment_(signed).pdf

3.6._Drug_Free_Workplace_(signed).pdf

3.7._Non-Collusive_Affidavit_(signed).pdf

3.8._Errors_or_Omissions_(signed).pdf

3.9._References-Similar_in_Scope_(completed).pdf

3.10._References-Projects_Actively_On_(completed).pdf

3.11._Certification_-Debarment,_Suspension_(signed).pdf

3.12._Trench_Safety_form_(signed).pdf

3.13._Bid_Form-Part_1_Summary_(signed).pdf

3.14._Bid_Form-Part_2_Detailed_A2.pdf

3.15._Bid_Cover_Sheet-Signed_Notarized_(signed).pdf

CGC003307_Cecil_Delcher_08.2024.pdf

CUC1223914_G.Deremer_08.2024.pdf

Detail_by_Entity_Name_01.2024.pdf

USW_W-9_Signed.pdf

2. I certify that I have read, understood and agree to the terms in this solicitation, and that I am authorized to submit this response on behalf of my company.*

☑ Confirmed ☐ Pass ☐ Fail

3. Response Checklist

By selecting confirm, you are certifying that you have submitted the corresponding attachments and documents as part of your submittal in the question, "Respondent Submittals (without cost)".

3.1. Page 22, Signed and Notarized--In Response ☐ Pass ☐ Fail

☑ Confirmed

3.2. Bid Bond Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.3. Public Entity Crimes-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.4. E-Verify Certification Form-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.5. Addenda Acknowledgment-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.6. Drug Free Workplace-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.7. Non-Collusive Affidavit-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.8. Errors or Omissions-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.9. References-Similar in Scope Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.10. References-Projects Actively On-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.11. Certification -Debarment, Suspension Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.12. Trench Safety form-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.13. Bid Form-Part 1 Summary - Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.14. Bid Form-Part 2 Detailed-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.15. Bid Cover Sheet-Signed/Notarized-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

PRICE TABLES

Northside Ph 3 Force Main/Water Line Ext

Item No.	Item Description	Quantity	Unit	Unit Price	Amount Total
1	Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements and General Conditions	1	LS	$107,676.00	$107,676.00
2	Traffic Control	1	LS	$25,000.00	$25,000.00
3	Environmental Protection	1	LS	$125,555.00	$125,555.00
4	Construction Survey and Layout	1	LS	$34,500.00	$34,500.00
5	6-Inch Sanitary Sewer Force Main via Open-Cut	9350	LF	$57.00	$532,950.00
6	6-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	3400	LF	$45.00	$153,000.00
7	8-Inch Sanitary Sewer Force Main via Open-Cut	4874	LF	$69.00	$336,306.00
8	8-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	250	LF	$66.00	$16,500.00

9	12-Inch Potable Water Main via Open-Cut	4525	LF	$105.00	$475,125.00
10	Combination Air/Vacuum Valves and Vaults	14	EA	$4,582.06	$64,148.84
11	Concrete Restoration	2150	SY	$150.00	$322,500.00
12	Limerock Restoration	406	SY	$35.00	$14,210.00
13	Asphalt Concrete Restoration	1033	SY	$35.00	$36,155.00
14	Testing Allowance ($25,000) Include this amount in your Total	1	AL	$25,000.00	$25,000.00
15	Record/As-Bult Drawings Allowance ($15,000) Include this amount in your Total	1	AL	$15,000.00	$15,000.00
	Total				**$2,283,625.84**

Contingency

10% of Total Bid Form

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	Contingency - 10%	1	EA	$228,362.58	$228,362.58
	Total				**$228,362.58**

Guarantee and Warranties: Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the City, shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor/Vendor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The

Contractor/Vendor shall remedy any defect in the work and pay for any damage to other work resulting there from, which shall appear within a period of one (1) year from the date of final acceptance of the work unless a longer period is specified. The City will give notice of observed defects with reasonable promptness.

All guarantees and warranties shall commence on the date of substantial completion or on acceptance by the owner of re-work items. The Contractor shall furnish a one (1) year unconditional warranty. The warranty shall include all manufacturers' warranties on equipment and material installed by the Contractor or any subcontractors. These items shall be transferred to the City and in the City's name. All warranty items shall be secured in an organized 3-ring binder.

City May Stop the Work: If the work is defective, or the Contractor/Vendor fails to supply sufficient skilled workmen or suitable materials or equipment or if the Contractor/Vendor fails to make prompt payments to Subcontractors for labor, materials, or equipment, the City may order the Contractor/Vendor to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the City to stop the work shall not give rise to any duty on the part of the City to exercise this right for the benefit of the Contractor/Vendor or any other party.

For each consecutive calendar day that the work remains incomplete after the date established for final completion, the Contractor/Vendor shall pay City and the City is authorized to retain from the compensation otherwise to be paid to the Contractor/Vendor the sum of the phase schedule, **$1000.00**. This amount is the minimum measure of damages the City will sustain by failure of the Contractor to complete all remedial work, correct deficient work, clean up the project and other miscellaneous tasks as required to complete all work specified. This amount is in addition to the liquidated damages prescribed above, and likewise shall not be construed as a penalty.

The Bidder hereby agrees that the City reserves the right to waive any bid and to reject any or all bids, or to accept any bid that in its judgment will be in the best interest of the City. The bidder's signature understands and acknowledges the requirements set forth in this bid package.

Signature/Print Name/Company

Gary Deremer, U.S. Water Services Corporation

January 12, 2024
Date

In witness whereof, the Bidder has hereunto set his signature and affixed his seal this 12th day of January A.D. ~~2023~~ 2024

(Seal)

By: Gary Deremer

Title: President

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

THE AMERICAN INSTITUTE OF ARCHITECTS

Executed in 1 Counterpart(s)

AIA Document A310

Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we
U. S. Water Services Corporation
4939 Cross Bayou Blvd.
New Port Richey, FL 34652
(Here insert full name and address or legal title of Contractor/Vendor)

as Principal, hereinafter called the Principal, and
Swiss Re Corporate Solutions America Insurance Corporation
1200 Main Street, Suite 800, Kansas City, MO 64105
(Here insert full name and address or legal title of Surety)
a corporation duly organized under the laws of the State of Missouri
as Surety, hereinafter called the Surety, are held and firmly bound unto
Zephyrhills FL
5335 8th Street, Zephyrhills, FL 33542
(Here insert full name and address or legal title of Owner)

Bonds and All Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

as Obligee, hereinafter called the Obligee, in the sum of Five Percent of Bid Amount
----------**Dollars ($** 5% of Bid

for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, The Principal has submitted a bid for
ITB-2023-02 Northside Water/Wastewater Force Main-Phase 3
(Here insert full name, address and description of project)

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and Sealed this 12th ***of*** January ***2023*** 4

U. S. Water Services Corporation

(Principal and Title) State of Incorporation: Florida
Gary Doremer, President

(Seal)

(Witness)

(Attorney-in-Fact & Licensed Resident Agent) April L. Lively
Swiss Re Corporate Solutions America Insurance Corporation
Guignard Company/Inquiries (407) 834-0022

(Surety Seal)

SWORN STATEMENT PURSUANT TO SECTION 287.133(3)(a),

SWISS RE CORPORATE SOLUTIONS

SWISS RE CORPORATE SOLUTIONS AMERICA INSURANCE CORPORATION ("SRCSAIC")
SWISS RE CORPORATE SOLUTIONS PREMIER INSURANCE CORPORATION ("SRCSPIC")
WESTPORT INSURANCE CORPORATION ("WIC")

GENERAL POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, THAT SRCSAIC, a corporation duly organized and existing under laws of the State of Missouri, and having its principal office in the City of Kansas City, Missouri, and SRCSPIC, a corporation organized and existing under the laws of the State of Missouri and having its principal office in the City of Kansas City, Missouri, and WIC, organized under the laws of the State of Missouri, and having its principal office in the City of Kansas City, Missouri, each does hereby make, constitute and appoint:

J.W. GUIGNARD, BRYCE R. GUIGNARD, PAUL J. CIAMBRIELLO, APRIL L. LIVELY, JENNIFER L. HINDLEY, MARGIE L. MORRIS, DEBORAH ANN MURRAY, M. GARY FRANCIS, CHRISTINE MORTON, KELLY PHELAN, and ALLYSON FOSS WING

JOINTLY OR SEVERALLY

Its true and lawful Attorney(s)-in-Fact, to make, execute, seal and deliver, for and on its behalf and as its act and deed, bonds or other writings obligatory in the nature of a bond on behalf of each of said Companies, as surety, on contracts of suretyship as are or may be required or permitted by law, regulation, contract or otherwise, provided that no bond or undertaking or contract or suretyship executed under this authority shall exceed the amount of:

TWO HUNDRED MILLION ($200,000,000.00) DOLLARS

This Power of Attorney is granted and is signed by facsimile under and by the authority of the following Resolutions adopted by the Boards of Directors of both SRCSAIC and SRCSPIC at meetings duly called and held on the 18th of November 2021 and WIC by written consent of its Executive Committee dated July 18, 2011.

"RESOLVED, that any two of the President, any Managing Director, any Senior Vice President, any Vice President, the Secretary or any Assistant Secretary be, and each or any of them hereby is, authorized to execute a Power of Attorney qualifying the attorney named in the given Power of Attorney to execute on behalf of the Corporation bonds, undertakings and all contracts of surety, and that each or any of them hereby is authorized to attest to the execution of any such Power of Attorney and to attach therein the seal of the Corporation; and it is

FURTHER RESOLVED, that the signature of such officers and the seal of the Corporation may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be binding upon the Corporation when so affixed and in the future with regard to any bond, undertaking or contract of surety to which it is attached."

SWISS RE CORPORATE SOLUTIONS AMERICA INSURANCE CORPORATION CORPORATE SEAL 1976 MISSOURI

SWISS RE CORPORATE SOLUTIONS PREMIER INSURANCE CORPORATION CORPORATE SEAL MISSOURI

By _____
Erik Janssens, Senior Vice President of SRCSAIC & Senior Vice President of SRCSPIC & Senior Vice President of WIC

By _____
Gerald Jagrowski, Vice President of SRCSAIC & Vice President of SRCSPIC & Vice President of WIC

WESTPORT INSURANCE CORPORATION CORPORATE SEAL MISSOURI

IN WITNESS WHEREOF, SRCSAIC, SRCSPIC, and WIC have caused their official seals to be hereunto affixed, and these presents to be signed by their authorized officers

this 10 day of NOVEMBER, 20 22

Swiss Re Corporate Solutions America Insurance Corporation
Swiss Re Corporate Solutions Premier Insurance Corporation
Westport Insurance Corporation

State of Illinois
County of Cook ss

On this 10 day of NOVEMBER, 20 22, before me, a Notary Public personally appeared Erik Janssens, Senior Vice President of SRCSAIC and Senior Vice President of SRCSPIC and Senior Vice President of WIC and Gerald Jagrowski, Vice President of SRCSAIC and Vice President of SPCSPIC and Vice President of WIC, personally known to me, who being by me duly sworn, acknowledged that they signed the above Power of Attorney as officers of and acknowledged said instrument to be the voluntary act and deed of their respective companies.

OFFICIAL SEAL
CHRISTINA MANISCO
NOTARY PUBLIC, STATE OF ILLINOIS
My Commission Expires March 28, 2026

Christina Manisco, Notary

I, Jeffrey Goldberg, the duly elected Senior Vice President and Assistant Secretary of SRCSAIC and SRCSPIC and WIC, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney given by said SRCSAIC and SRCSPIC and WIC, which is still in full force and effect.
IN WITNESS WHEREOF, I have set my hand and affixed the seals of the Companies this 12th day of January, 20 24.

Jeffrey Goldberg, Senior Vice President & Assistant Secretary of SRCSAIC and SRCSPIC and WIC

FLORIDA STATUTES ON PUBLIC ENTITY CRIMES- ITB-2023-02

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.

A. This sworn statement is submitted to City of Zephyrhills
(print name of the public entity)

by Gary Deremer, President
(print individual's name and title)

for U.S. Water Services Corporation
(print name of entity submitting sworn statement)

whose business address is

4939 Cross Bayou Blvd., New Port Richey FL 34652

and (if applicable) its Federal Employer Identification Number (FEIN) is 20-0008821
(If the entity has no FEIN, include the Social ro Number of the individual signing this sworn statement: .)

B. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

C. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

D. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes means:

a. A predecessor or successor of a person convicted of a public entity crime; or
b. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

E. I understand that a "person" as defined in Paragraph 287.133(1)(e), Florida Statutes means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or

applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

F. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Indicate which statement applies.)

X Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (attach a copy of the final order)

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

_____
(Signature) Gary Deremer, President
U.S. Water Services Corporation
4939 Cross Bayou Blvd. New Port Richey FL 34652
State of Incorporation: Florida

Sworn to and subscribed before me this 12th day of January 2024, 2023 Personally or known
Or Produced identification_____ Notary Public – State of Florida

_____
My commission expires 1/26/2025 (Type of Identification) _____
(Printed, Typed or stamped commissioned name of notary public)

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

E-VERIFY CERTIFICATION FORM- ITB 2023-02

All vendors, contractors and subcontractors doing business with the City of Zephyrhills must certify that they have implemented the federal E-Verify program.

E-Verify is a federal system established by the Department of Homeland Security to determine the immigration and work-eligibility status of prospective employees. Detailed E-Verify program information for employers can be found at http://www.dhs.gov/e-verify

Prior to providing goods or services to the City of Zephyrhills, vendors must certify compliance with the federal E-Verify program. In the case of contractors, this includes obtaining written certification from all subcontractors who will participate in the performance of the contract. The certification below has been prepared for all vendors and contractors to use for this purpose. All subcontractor certifications must be kept on file with the contract vendor and made available to the state and/or City upon request.

CERTIFICATION

(In accordance with Executive Order No. 11-02)

I certify that the company shown below is in compliance with the above statement and that I am authorized to sign on its behalf.

Name of Company: U.S. Water Services Corporation

Authorized Signature:

Printed Name/Title: Gary Deremer, President

Address: 4939 Cross Bayou Blvd., New Port Richey FL 34652

Date: January 12, 2024

Phone: 727 848 8292 x 222

Email: CCREGO@USWATERCORP.NET

The City of Zephyrhills reserves the right to determine how it will respond to any instances of non-compliance or false certification of compliance. Potential City actions include, but are not limited to, cancellation of the contract and/or suspending or debarring the contract vendor from performing services in any aspect to the City.

Please send the completed form with your submittal.

DRUG-FREE WORKPLACE FORM- ITB 2023-02

The undersigned vendor, in accordance with Florida Statute 287.087, hereby

certifies that U.S. Water Services Corporation does:
(Name of Business)

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business' policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or pleas of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm fully complies with the above requirements.

Bidder's Signature

Gary Dermer, President
U.S. Water Services Corporation
4939 Cross Bayou Blvd., New Port Richey FL 34652
State of Incorporation: Florida

January 12, 2024
Date

PUR062.036
re. 10/97

DRUG-FREE WORKPLACE FORM- ITB 2023-02

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(Name of Business)

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Gary Dermer, President
U.S. Water Services Corporation
4939 Cross Bayou Blvd., New Port Richey FL 34652
State of Incorporation: Florida

January 12, 2024
Date

PUR062.036
re. 10/97

NON-COLLUSIVE AFFIDAVIT- ITB 2023-02

State of Florida
County of Pasco

Gary Deremer, being first duly sworn, deposes and says that he/she is

President of U.S. Water Services Corporation, the party making the fore-going submittal of qualifications or bid that such submittal
(partner or officer of the Firm, etc)

Or bid is genuine and not collusive or sham; that said Firm has not colluded, conspired, connived or agreed, directly or indirectly, with any Firm or person, to put in a sham response or to refrain from responding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person, to secure any advantage against the City of Zephyrhills of any person interested in the proposed contract; and that all statements in said response are true.

Officer Gary Deremer, Presidemt
State of Incorporation: Florida

U.S. Water Services Corporation *(Company Name)*
4939 Cross Bayou Blvd.,
New Port Richey FL 34652

State of Florida
County of Pasco

The foregoing instrument was acknowledged before me this 12th day of January 2024
by
Gary Deremer, President *(name and title of corporate officer)*
of U.S. Water Services Corporation *(Name of Corporation),*
a Florida *(state or place of incorporation)* corporation, on behalf of the corporation. He/she is personally known to me or has produced _____ *(Identification type)*
as identification.

Christina R. Crego *(Signature line for notary public)*

Christina R. Crego *(Name of notary type, printed or stamped)*

_____ *(Title or rank)*

My commission expires: January 26, 2025
Serial number, if any _____

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

Errors or Omissions- ITB 2023-02

Upon review of this project's plans and construction documents are you aware of any apparent errors or omissions?

☐ YES

☒ No

If YES, please provide a detailed explanation of any apparent errors or omissions on this sheet.

January 12, 2024

Company Representative **Date**

Gary Deremer, President
U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652
State of Incorporation: Florida

REFERENCES –PROJECTS OF SIMILAR SCOPE- ITB 2023-02

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: Hernando County BOCC
Project Name: Hill-N-Dale WM Replacement Project Amount: $ 782,593.20
Start Date: 1/31/22 Finished Date: 11/14/23
Description: Installation of new water mains and fire hydrants in the Azen Loop service area of the Hill-n-Dale subdivision to replace the existing aging water mains and abandon the existing water mains and meters that are in the customers back yards and replace them with new water mains and meters that will be installed in the road right-of-way for easier maintenance.
Contact Name: Charles Turner, PM Phone: 352 540 6219
Email: cturner@hernandocounty.us Within Budget: YES ☒ NO ☐ *Explain

Reference 2: Company Name: Hernando County BOCC
Project Name: Berkeley Manor Flow Diversion LS Rehab Project Amount: $ 742,165.28
Start Date: 1/13/22 Finished Date: 5/5/23
Description: installation of a new generator. The existing wet well, new valve vault, and new collector manhole will be coated per HCUD specifications Section 9. The station will receive a new electrical service and panel as well. There is approximately 900' of ten inch force main to be installed along with an approximately 170' of eight inch force main under US 19 via directional bore.
Contact Name: Brad Smith, PM Phone: 352 758 4858
Email: bsmith@hernandocounty.us Within Budget: YES ☒ NO ☐ *Explain

Reference 3: Company Name: City of Hampton
Project Name: Water Main Loop Project Phase 2 Project Amount: $ 212,298.00
Start Date: 12/16/22 Finished Date: 8/8/23
Description: Loop water mains to improve water conservation, remove dead ends to improve water quality, reduce system flushing, and reduce water age associated with water stagnation at dead ends. New isolation valves to improve the capability to repair line breaks.
Contact Name: Mary Lou Hildreth Phone: 352 468 1201
Email: coh1@outlook.com Within Budget: YES ☒ NO ☐ *Explain

Reference 4: Company Name: City of Leesburg
Project Name: FM Installation - Canal Street WWTF Project Amount: $ 96,416.63
Start Date: 8/2/21 Finished Date: 11/9/21
Description: Replacement of a force main from an existing 16-inch ductile iron force main over to a new 16-inch C900 PVC force main. The old ductile iron force main will then be abandoned and shall be grout filled with flowable fill and properly capped.
Contact Name: Ryan Gerdon Phone: 352 705 0248
Email: Ryan.gerdon@leesburgflorida.gov Within Budget: YES ☒ NO ☐ *Explain

* Additional references on next page

REFERENCES –PROJECTS OF SIMILAR SCOPE- ITB 2023-02

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: City of Hampton
Project Name: Water Main Loop Project Project Amount: $ 158,717.59
Start Date: 7/2/21 Finished Date: 9/30/21
Description: Loop water mains to improve water conservation, remove dead ends to improve water quality, reduce system flushing, and reduce water age associated with water stagnation at dead ends. New isolation valves to improve the capability to repair line breaks.

Contact Name: Mary Lou Hildreth Phone: 352 468 1201
Email: coh1@outlook.com Within Budget: YES ☒ X NO ☐ *Explain

Reference 2: Company Name: City of Leesburg
Project Name: Gravity Main-Pamela Street - 210171 Project Amount: $ 178,931.00
Start Date: 8/2/21 Finished Date: 9/15/21
Description: Relocate existing sewer main. A new sewer main will be constructed and the old sewer main abandoned in place with flowable fill.

Contact Name: Ryan Gerdon Phone: 352 705 0248
Email: Ryan.Gerdon@leesburgflorida.gov Within Budget: YES ☒ X NO ☐ *Explain

Reference 3: Company Name: City of Waldo
Project Name: CDBG 18 NR Water Main Replacements Project Amount: $ 410,220.35
Start Date: 5/18/20 Finished Date: 3/22/21
Description: The Project consisted of furnishing all labor, equipment, and materials necessary to construct approximately 4,200 LF of 6" PVC water mains, including valves, fittings, fire hydrants, water services, and associated restoration; and the rehabilitation of Lift Station No. 1, including new pumps, piping, control panel, etc.
Contact Name: Timothy Norman, P.E. Phone: 904 278 0030
Email: Tnorman@mittauer.com Within Budget: YES ☒ X NO ☐ *Explain

Reference 4: Company Name: FGUA
Project Name: Colonial Manor WM Replacement, CSP08 Project Amount: $ 1,566,312.29
Start Date: 10/8/18 Finished Date: 3/11/21
Description: Replae approx' 8,504 LF of WM in the Colonial Manor development. Installation of new WM within the ROW, installation of new service connections, relocation of existing meters to be installed in new meter boxes, removal of existing meter boxes, installation of new service laterals, installation of fire hydrants, and grouting in place existing water mains (4" and greater only). Surveys, maintenance of traffic, sodding and site restoration.
Contact Name: Robert Dickson, P.E. Phone: 407 629 6900
Email: rdickson@govmserv.com Within Budget: YES ☒ X NO ☐ *Explain

REFERENCES –FOR CURRENTLY ACTIVE PROJECTS- ITB 2023-02

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: FGUA (Florida Governmental Utility Authority)
Project Name: 180th Ave Package Plant Abatement Project Amount: $ 706,474.00
Start Date: 8/7/2023 Finished Date: In progress
Description: Work of the Project includes construction of approximately 2,220 liner feet (LF) of 4-inch force main by open trench excavation and 500 linear feet (LF) of force main by horizontal directional drilling (HDD)

Contact Name: Jordan Jayashekaramurthy, CPM GSG Phone: 407 629 6900
Email: jodanjay@govmserv.com Within Budget: YES □ NO □*Explain

Reference 2: Company Name: FGUA (Florida Governmental Utility Authority)
Project Name: Jungle Den Inflow & Infiltration Correction and LS Upg Project Amount: $ 2,582,935.00
Start Date: 6/6/2023 Finished Date: in progress
Description: see following page

Contact Name: Robert Gonzalez, P.E. Phone: 407 425 0452
Email: rgonzalez@cphcorp.com Within Budget: YES X NO □*Explain

Reference 3: Company Name: Pasco County BOCC
Project Name: Pasco Aqua Utility System Improvements Project Amount: $ 3,996,354.14
Start Date: 10/25/22 Finished Date: in progress
Description: see following page

Contact Name: Kurt Heath, P.E. Phone: 813 760 1964
Email: Kurt@stroudengineering.com Within Budget: YES X NO □*Explain

Reference 4: Company Name: City of Casselberry
Project Name: PW 2007 Sausalito FM Replacement Project Amount: $ 1,501,270.90
Start Date: 6/27/22 Finished Date: in progress
Description: Install approx 6,000 LF of 10-inch FM consisting of; Repair sidewalk, driveway and asphalt road; Coordinate with City to re-direct flow from existing lift stations (open and closing valves), in order to have existing FM without flow; Restoration of site landscaping, irrigation, roadway and other affected facilities; Connection to existing Lift Station piping and existing Force Main on South Winter Park Drive;
Contact Name: Stefano Ceriana Phone: 407 917 5697
Email: sceriana@chacompanies.com Within Budget: YES X NO □*Explain

Ref #2
- Relocate LS 01: One (1) 8 ft dia. wet well with dual pumps, valves above ground, new electrical panel and generator on-site. Connect gravity sewer and force main: one (1) MH, approx 446 LF of 8-inch PVC gravity main and approx 56 LF of 4-inch PVC force main to be connected to 6-inch PVC at the WWTF Headworks.
- Relocate LS 02: One (1) 6 ft dia. wet well with dual pumps, valves above ground, new electrical panel. Connect gravity sewer and force main: two (2) MHs, approx 225 LF of 8-inch PVC gravity main, approx 25 LF of 4-inch PVC force main and extend approx 60 LF of 6-inch PVC lateral for Condominiums to the new MH.
- Repair and replace gravity sewer: At Jungle Den Villas Condominiums install approx 279 LF of 8-inch PVC gravity main and add one (1) MH to relocate the gravity sewer into the existing utility easement. On Juno Trail Road, Alice Drive and River Road line and repair approx 3,000 LF of gravity

Ref #3
At the Jasmine Lakes community, installation of a new sewer conveyance and pumping system, including a new duplex lift station, 710 linear feet of 6-inch diameter PVC force main piping, and 470 linear feet of 8-inch diameter PVC force main piping by open cut methods. The force main piping work requires the removal of abandoned utility piping, including 900 linear feet of 12-inch diameter PVC piping and 800 linear feet of 8-inch diameter asbestos cement piping. Upon completion and activation of the new pumping system, the existing wastewater treatment facility shall be abandoned and demolished. The work shall also include installation of a new primary and secondary potable water connection for the community, including 690 linear feet of 8-inch diameter PVC water main piping by open cut methods and two (2) aboveground meter and control valve assemblies. At the Palm Terrace community, installation of a new gravity sewer collection and pumping system, including 250 linear feet of gravity sewer piping, four (4) manholes, a new duplex lift station, 1,710 linear feet of 6-inch diameter PVC force main piping by open cut methods, and 2,140 linear feet of 6-inch diameter HDPE force main piping by horizontal directional drilling methods along Ranch Road, with three (3) separate drill lengths. Upon completion and activation of the new pumping system, the existing wastewater treatment facility shall be abandoned and demolished. The work shall also include installation of a new secondary potable water connection for the community, including 140 linear feet of 6-inch diameter PVC water main piping and an aboveground meter and control valve assembly. At the Zephyr Shores community, installation of a new primary and secondary potable water connection for the community, including 200 linear feet of 6-inch diameter PVC water main piping, 120 linear feet of 8-inch diameter PVC water main piping, 50 linear feet of 16-inch diameter steel casing by jacking and boring methods, an aboveground meter and backflow prevention assembly, and an aboveground meter and control valve assembly

REFERENCES –FOR CURRENTLY ACTIVE PROJECTS- ITB 2023-02

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: American Beach Water and Sewer District
Project Name: Well and Septic Tank Phase Out Program Project Amount: $ 7,831,538.00
Start Date: _____ Finished Date: _____
Description: The project includes the installation of approximately 12,400 linear feet of 8" PVC gravity pipe within the existing American Beach community via open-cut installation. (additional information at the bottom of page)

Contact Name: Teresa Irby-Butler, P.E. Phone: 407 629 6900
Email: teresa.irby-butler@fgua.com Within Budget: YES ☒ X NO ☐*Explain

Reference 2: Company Name: _____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date: _____
Description: _____

Contact Name: _____ Phone: _____
Email: _____ Within Budget: YES ☐ NO ☐*Explain

Reference 3: Company Name: _____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date: _____
Description: _____

Contact Name: _____ Phone: _____
Email: _____ Within Budget: YES ☐ NO ☐*Explain

Reference 4: Company Name: _____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date: _____
Description: _____

Contact Name: _____ Phone: _____
Email: _____ Within Budget: YES ☐ NO ☐*Explain

A. The project includes the installation of approximately 12,400 linear feet of 8" PVC gravity pipe within the existing American Beach community via open-cut installation. The open cut will occur in the center of each roadway as identified in the contract drawings. Installation of the gravity sewer system includes the installation of approximately 42 precast concrete manholes, pipe fittings, and sewer laterals to the edge of the right of way. Manhole interior and exterior surfaces shall be coated per JEA standards.
B. The proposed gravity sewer system includes the installation of two new lift stations. Each lift station shall be equipped with submersible pumps, control panels, level control, and mission communications as identified in the contract drawings. The lift station wet wells shall be coated and lined per JEA standards.
C. The proposed sewer system includes approximately 2,600 linear feet of 4-inch PVC force main and associated appurtenances as shown on the contract drawings. All materials and protective linings and coatings for corrosion protection shall abide by JEA standards.
D. Sewer service laterals shall be provided to the parcels shown on the contract drawings. Installation of sewer service laterals shall be within the public right-of-way and shall terminate at the private property lines with above grade, visible demarcation per JEA standard details.
E. The proposed potable water main system includes the installation of approximately 12,300 linear feet new PVC pipe via open-cut installation. Pipe diameters will be 4-inch, 6-inch, and 8-inch as shown on the contract drawings. Installation of the potable water main system includes approximately 16 fire hydrants, approximately 287 service laterals, water meter boxes at all occupied parcels, and water main isolation valves and boxes.
F. Contractor shall be responsible for the relocation of gopher tortoises within the project boundaries and as required by all applicable permits.
G. Roadways shall be resurfaced at the conclusion of the project and to the extent as identified on the contract drawings. Contractor shall be responsible for maintenance of traffic during the entire duration of the project.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion Form- ITB 2023-02

1. The prospective Vendor, U.S. Water Services Corporation, certifies, by submission of this document, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any Federal Department or Agency.

2. Where the Vendor is unable to certify to the above statement, the prospective Vendor shall attach an explanation to this form.

Vendor: U.S. Water Services Corporation
Name of Company – Please Print

Signature: _____
Authorized Company Representative

Name/Title: Gary Deremer, President

Address: U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652
State of Incorporation: Florida

Date: January 12, 2024

CERTIFICATION OF CONTRACTOR REGARDING TRENCH SAFETY- ITB 2023-02

This certification is required pursuant to the Trench Safety Act, Chapter 90-98, Florida Statutes regarding Trench Safety. The Act specifically incorporates the Occupational Safety and Health Administration's excavation safety standards, 29 CFR S. 1928.650 Subpart P as the State standard. Any revision to OSHA's safety standards that are consistent with the Florida Statues shall also be complied with upon its effective date. The act requires that any bidder or prospective contractor, or any of their proposed subcontractors, shall provide written assurance that the contractor will comply with the applicable trench safety standards.

Name of Contractor: U.S. Water Services Corporation

Address: 4939 Cross Bayou Blvd.,
New Port Richey FL 34652

Phone: 727 848 8292

1. Contractor agrees that he is aware of the Trench Safety Act and the requirements of the Act.
2. Contractors agrees to comply with all applicable trench safety standards as set forth in the Act and as referenced in the Act.

Name of Signer: Gary Deremer
PLEASE PRINT

Title: President

Signature:

Date: January 12, 2024

U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652
State of Incorporation: Florida

BID RESPONSE FORM

Detailed Bid Form to be Submitted on Page 6, Technical Specifications

In accordance with the Specifications contained herein, I certify that any and all information contained in this bid response is true; and I further certify that this bid is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a bid for the same materials, supplies, equipment, or services and is in all respects fair and without collusion or fraud. I agree to abide by all terms and conditions of the bid, and certify that I am authorized to sign for the applicant firm. *Please print the following and sign your name.*

Amount of Base Bid	$ 2,283,625.84
10% Contingency *Contingency is not guaranteed.*	$ 228,362.58
Total Contract Sum (Amount of Bid + Contingency)	$ 2,511,988.42

Any contingency items shall be communicated by written change order and shall be approved by both the Owner and Contractor.

Total Contract Sum of Bid in Words: TWO MILLION FIVE HUNDRED ELEVEN THOUSAND NINE HUNDRED EIGHTY-EIGHT AND FORTY-TWO HUNDREDTHS

The **BIDDER** must submit a bid on all items contained in specification or the bid shall be considered irregular. The **OWNER** reserves the right to accept or reject the bid. The **OWNER**, or his representative, further reserves the unqualified right to determine whether any particular item or items or materials, equipment, or whatsoever is an approved equal, and reserves the unqualified right to a final decision regarding the approval or rejection of the same. The bid selection shall be based on the apparent low bidder for the **"TOTAL CONTRACT SUM"**.

Add'l Documents Included:

- [X] **Bid Form**
- [X] **Bid Bond/Check**
- [X] **References**
- [X] **Public Entity Crimes**
- [X] **License(s) copies**
- [X] **Drug Free Workplace**
- [ ] **No-Bid**
- [X] **Page 22, Signature/Seal**
- [X] **Addenda Affidavit**
- [X] **E-Verify**
- [X] **Non Collusive**
- [X] **Certification re: Debarment, Suspension, Ineligibility & Voluntary Exclusion**

NAME, ADDRESS, AND SIGNATURE OF BIDDER:

NAME: Gary Deremer **TITLE:** President

ADDRESS: 4939 Cross Bayou Blvd., New Port Richey FL 34652

PHONE: 727 848 8292 **FAX:** 727 842 6412

E-MAIL ADDRESS: CCREGO@USWATERCORP.NET

BIDDER SIGNATURE: _____ **DATE:** January 12, 2024

Corporate Seal or Notarization below date

Water Services Corporation CORPORATE SEAL 2003 FLORIDA U.S.

BID REQUIREMENTS

CITY OF ZEPHYRHILLS

Northside Phase 3 Force Main/Water Line Extension

CONSTRUCTION ITEMIZED PRICING SHEET

Item No.	Item Description	Qty.	Unit	Unit Price	Amount
BASE BID					
1	Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions	1	LS	$107,676.00	$107,676.00
2	Traffic Control	1	LS	$25,000.00	$25,000.00
3	Environmental Protection	1	LS	$125,555.00	$125,555.00
4	Construction Survey and Layout	1	LS	$34,500.00	$34,500.00
5	6-Inch Sanitary Sewer Force Main via Open-Cut	9,350	LF	$57.00	$532,950.00
6	6-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	3,400	LF	$45.00	$153,000.00
7	8-Inch Sanitary Sewer Force Main via Open-Cut	4,874	LF	$69.00	$336,306.00
8	8-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	250	LF	$66.00	$16,500.00
9	12-Inch Potable Water Main via Open-Cut	4,525	LF	$105.00	$475,125.00
10	Combination Air/Vacuum Valves and Vaults	14	EA	$4,582.06	$64,148.84
11	Concrete Restoration	2,150	SY	$150.00	$322,500.00
12	Limerock Restoration	406	SY	$35.00	$14,210.00
13	Asphalt Concrete Restoration	1,033	SY	$35.00	$36,155.00
14	Testing Allowance	1	AL	25,000.00	$25,000.00
15	Record/As-Built Drawings Allowance	1	AL	15,000.00	$15,000.00
	TOTAL BID PRICE	2,283,625.84			

AGENCY:		INVITATION TO BID
CITY OF ZEPHYRHILLS ATTN: PURCHASING DEPT 5335 8TH STREET ZEPHYRHILLS, FL 33542	Zephyrhills jump right in	Response Acknowledgement

PURCHASING AGENT: Karen Miller	AN EQUAL OPPORTUNITY EMPLOYER	
Phone: 813-780-0000 x3536	FLORIDA TAX EXEMPT	#85-8012740166C-4
Email: kmiller@ci.zephyrhills.fl.us	FEDERAL IDENTIFICATION NUMBER	#59-6000455

Obtained ALL Bid Documents and Submit Q&A and Responses electronically on: OPENGOV - LINK ON WEBSITE WWW.CI.ZEPHYRHILLS.FL.US

BID/PROPOSAL NUMBER	DISTRIBUTION DATE	BID/PROPOSAL TITLE	BID/PROPOSAL RESPONSES OPENING DATE/TIME
ITB-2023-02	11/20/2023	Northside Water/Wastewater Forcemain-Phase 3	OPENGOV Online- Friday, January 12, 2024 before 10 AM

TELE CONFERENCE DATE GoTo Meetng ☒ Strongly Recommended ☐ None

DATE: 12-4-2023 **TIME:** 10:00 AM 2nd Floor Conference Room

GoTo LINK: https://meet.goto.com/159259221

Call: 1-224-501-3412 **ACCESS CODE: 159-259-221**

RESPONSES RECEIVED AFTER ABOVE DATE AND TIME WILL NOT BE ACCEPTED

Bid Bonds must be received

SITE VISIT: After the Meeting

VENDOR MUST COMPLETE THE BELOW AREAS AND RETURN FORM, NOTARIZED. FORM IS REQUIRED.

RESPONDER'S NAME/ADDRESS:
U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652

If returning as a "NO" state reason:

TELPHONE NUMBER: 727 848 8292

EMAIL ADDRESS: CCREGO@USWATERCORP.NET

I certify this Response is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a Response for the same materials, supplies or equipment, and is in all respects fair and without collusion or fraud. I agree to all conditions of this Bid/Proposal and certify that I am authorized to sign this Response for the company. In submitting a Response to the City of Zephyrhills the Responder offers and agrees that if this Response is accepted, the Company will convey, sell, assign or transfer to the City of Zephyrhills all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the Anti-trust laws of the United States and the State of Florida for price fixing relating to the particular commodities or services purchased or acquired by the City of Zephyrills. At the City's discretion, such assignment shall be made and become effective at the time the City tenders final payment to the Company.

FEDERAL EMPLOYER ID NUMBER OR SS NUMBER:
20-0008821

X

AUTHORIZED SIGNATURE

Gary Deremer, President

PRINTED NAME/TITLE

THIS FORM MUST BE NOTARIZED BELOW

Sworn to and subscribed to me this 12th day of January, 2024

Personally known: ☑ Or produced identification: ☐

Type of ID: _____

Christina R. Arego — Florida

Notary Signature — State

My commission expires: January 26, 2025

AFFIX NOTARY STAMP BELOW

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

BONDS

An EBond shall be included in your uploaded response or a certified check delivered to City Hall before the deadline for an amount not less than five (5%) of the total bid price and shall be made payable to the City as a guarantee that the Bidder will not withdraw his bid for a period of forty-five (45) days after bid closing time. Bid, Payment and Performance Bond and all Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

THE CITY OF ZEPHYRHILLS RESERVES THE RIGHT TO REJECT ANY OR ALL PROPOSALS, TO WAIVE INFORMALITIES, AND TO ACCEPT ALL OR ANY PART OF ANY RESPONSE/PROPOSAL AS MAY BE DEEMED TO BE IN THE BEST INTEREST OF THE CITY UNLESS OTHERWISE NOTED, PAYMENT OF GOODS OR SERVICES PROVIDED AS A RESULT OF THIS SOLICITATION WILL BE MADE PER FLORIDA STATUTE. ALL VENDORS MUST SUBMIT A COMPLETED W-9 FORM.

Ron DeSantis, Governor

Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE GENERAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

DELCHER, CECIL R

U S WATER SERVICES CORPORATION
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY FL 34652

LICENSE NUMBER: CGC003307

EXPIRATION DATE: AUGUST 31, 2024

Always verify licenses online at MyFloridaLicense.com

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Ron DeSantis, Governor

Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE UNDERGROUND UTILITY & EXCAVATION CO HEREIN IS CERTIFIED UNDER THE PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

DEREMER, GARY ANDREW

US WATER SERVICES CORPORATION
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY FL 34652

LICENSE NUMBER: CUC1223914

EXPIRATION DATE: AUGUST 31, 2024

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Detail by Entity Name

Florida Profit Corporation
U.S. WATER SERVICES CORPORATION

Filing Information

Document Number	P03000047833
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Status	ACTIVE
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Event Date Filed	03/31/2020
Event Effective Date	NONE

Principal Address

4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Changed: 03/31/2004

Mailing Address

4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Changed: 05/09/2005

Registered Agent Name & Address

DEREMER, GARY A
4939 CROSS BAYOU BOULEVARD

NEW PORT RICHEY, FL 34652

Name Changed: 03/31/2020

Address Changed: 03/31/2020

Officer/Director Detail

Name & Address

Title CEO

DEREMER, GARY
4939 CROSS BAYOU BLVD.
NEW PORT RICHEY, FL 34652

Title VP

DELCHER, CECIL
4939 CROSS BAYOU BLVD.
NEW PORT RICHEY, FL 34652

Title VP

AMIOTT, RALPH
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

KADER, MOHAMMED
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP, Secretary

Mitchell, Edward
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title CFO

RUPE, KAYCEE
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

SALIBA, CHRIS
4939 CROSS BAYOU BOULEVARD

NEW PORT RICHEY, FL 34652

Title VP

RENDELL, WILLIAM TROY
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

DUPONT, JEFFREY
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

VOSS, AARON
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title SVP

Elias, Dan
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title SVP

Jones, Kenneth
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

Benderski, Ron
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

SCHULTZ, DAVID, Jr.
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Annual Reports

Report Year	Filed Date
2021	01/20/2021
2022	01/24/2022

2023	01/11/2023

Document Images

01/11/2023 -- ANNUAL REPORT	View image in PDF format
01/24/2022 -- ANNUAL REPORT	View image in PDF format
01/20/2021 -- ANNUAL REPORT	View image in PDF format
03/31/2020 -- Amended and Restated Articles	View image in PDF format
01/16/2020 -- ANNUAL REPORT	View image in PDF format
09/25/2019 -- Amendment	View image in PDF format
04/04/2019 -- ANNUAL REPORT	View image in PDF format
03/02/2018 -- ANNUAL REPORT	View image in PDF format
04/24/2017 -- ANNUAL REPORT	View image in PDF format
04/15/2016 -- ANNUAL REPORT	View image in PDF format
02/19/2015 -- ANNUAL REPORT	View image in PDF format
02/26/2014 -- ANNUAL REPORT	View image in PDF format
03/18/2013 -- ANNUAL REPORT	View image in PDF format
04/19/2012 -- ANNUAL REPORT	View image in PDF format
04/13/2011 -- ANNUAL REPORT	View image in PDF format
04/02/2010 -- ANNUAL REPORT	View image in PDF format
04/29/2009 -- ANNUAL REPORT	View image in PDF format
03/31/2008 -- ANNUAL REPORT	View image in PDF format
04/30/2007 -- ANNUAL REPORT	View image in PDF format
04/30/2006 -- ANNUAL REPORT	View image in PDF format
05/09/2005 -- ANNUAL REPORT	View image in PDF format
03/31/2004 -- ANNUAL REPORT	View image in PDF format
08/07/2003 -- Amendment	View image in PDF format
06/09/2003 -- Off/Dir Resignation	View image in PDF format
04/30/2003 -- Domestic Profit	View image in PDF format

Previous On List Next On List Return to List

us water services
Search

Events **No Name History**

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

▶ **Go to *www.irs.gov/FormW9* for instructions and the latest information.**

Give Form to the requester. Do not send to the IRS.

Print or type. See **Specific Instructions** on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

U.S. Water Services Corporation

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☑ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

4939 Cross Bayou Boulevard

Requester's name and address (optional)

6 City, state, and ZIP code

New Port Richey, FL 34652

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN,* later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

2	0	–	0	0	8	8	2	1	

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here Signature of U.S. person ▶ Edward Mukeen Date ▶ 02/28/2019

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9.*

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

City Council Meeting
February 26, 2024

Action Item

CONSENT ITEMS 2.5

Award Bid Number ITB 2023-03 for the South 301 Water and Sewer Improvement Project to US Water

Issue:

Award Bid Number ITB 2023-03 for the South 301 Water and Sewer Improvement Project to US Water

Background:

This project will allow the City to better serve the area south of C Avenue to the Tucker Rd. area mainly along Hwy 301 with the opportunity to serve additional parcels east and west of the highway.

Attachment(s):

1. Exhibit A - ITB 2023-03(30378134.1)
2. Exhibit B - ITB 2023-03(30378127.1)
3. Exhibit C - ITB 2023-03(30378128.1)
4. Exhibit D - ITB 2023-03(30378173.1)

Fiscal Impact:

The City received 10 responses ranging from $999,765.80 to 2,967,165.00.
The estimated costs for the project was $1.7 million with a low bid from US Water for $999,765.80, with a 10% contingency. A portion of this project is funded by the FDEP in the amount up to $650,000.00.

Staff Recommendation:

Staff recommends approval to the City Council for the bid award as presented.

AGENCY:		INVITATION TO BID
CITY OF ZEPHYRHILLS ATTN: PURCHASING DEPT 5335 8TH STREET ZEPHYRHILLS, FL 33542	Zephyrhills jump right in	Response Acknowledgement
PURCHASING AGENT: Karen Miller Phone: 813-780-0000 x3536 Email: kmiller@ci.zephyrhills.fl.us	AN EQUAL OPPORTUNITY EMPLOYER FLORIDA TAX EXEMPT #85-8012740166C-4 FEDERAL IDENTIFICATION NUMBER #59-6000455	

Obtained ALL Bid Documents and Submit Q&A and Responses electronically on: OPENGOV - LINK ON WEBSITE WWW.CI.ZEPHYRHILLS.FL.US

BID/PROPOSAL NUMBER	DISTRIBUTION DATE	BID/PROPOSAL TITLE	BID/PROPOSAL RESPONSES OPENING DATE/TIME
ITB 2023-03	11/20/2023	South 301 W Water & Wastewater Pipeline	OpenGov Online- Friday, January 12, 2024 before 1 PM

TELE CONFERENCE DATE GoTo Meetng ☒ Strongly Recommended ☐ None

DATE: 12-4-2023 TIME: 10:00 AM 2nd Floor Conference Room

GoTo LINK: https://meet.goto.com/159259221 Or, City Hall-2nd Flr Conf Rm

Call: 1-335-602-4523 ACCESS CODE: 269-369-332

RESPONSES RECEIVED AFTER ABOVE DATE AND TIME WILL NOT BE ACCEPTED

Bid Bonds must be received

SITE VISIT: After the Meeting

VENDOR MUST COMPLETE THE BELOW AREAS AND RETURN FORM, NOTARIZED. FORM IS REQUIRED.

RESPONDER'S NAME/ADDRESS:

TELPHONE NUMBER:

EMAIL ADDRESS:

If returning as a "NO" state reason:

I certify this Response is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a Response for the same materials, supplies or equipment, and is in all respects fair and without collusion or fraud. I agree to all conditions of this Bid/Proposal and certify that I am authorized to sign this Response for the company. In submitting a Response to the City of Zephyrhills the Responder offers and agrees that if this Response is accepted, the Company will convey, sell, assign or transfer to the City of Zephyrhills all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the Anti-trust laws of the United States and the State of Florida for price fixing relating to the particular commodities or services purchased or acquired by the City of Zephyrills. At the City's discretion, such assignment shall be made and become effective at the time the City tenders final payment to the Company.

FEDERAL EMPLOYER ID NUMBER OR SS NUMBER:

X

AUTHORIZED SIGNATURE

PRINTED NAME/TITLE

THIS FORM MUST BE NOTARIZED BELOW

Sworn to and subscribed to me this ___ day of _____, 2024

Personally known: ☐ Or produced identification: ☐

Type of ID: _____

_____ _____

Notary Signature State

My commission expires: _____

AFFIX NOTARY STAMP BELOW

BONDS

An EBond shall be included in your uploaded response or a certified check delivered to City Hall before the deadline for an amount not less than five (5%) of the total bid price and shall be made payable to the City as a guarantee that the Bidder will not withdraw his bid for a period of forty-five (45) days after bid closing time. Bid, Payment and Performance Bond and all Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

THE CITY OF ZEPHYRHILLS RESERVES THE RIGHT TO REJECT ANY OR ALL PROPOSALS, TO WAIVE INFORMALITIES, AND TO ACCEPT ALL OR ANY PART OF ANY RESPONSE/PROPOSAL AS MAY BE DEEMED TO BE IN THE BEST INTEREST OF THE CITY UNLESS OTHERWISE NOTED, PAYMENT OF GOODS OR SERVICES PROVIDED AS A RESULT OF THIS SOLICITATION WILL BE MADE PER FLORIDA STATUTE. ALL VENDORS MUST SUBMIT A COMPLETED W-9 FORM.

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BID RESPONSE FORM

Detailed Bid Form to be Submitted on Page 6, Technical Specifications

In accordance with the Specifications contained herein, I certify that any and all information contained in this bid response is true; and I further certify that this bid is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a bid for the same materials, supplies, equipment, or services and is in all respects fair and without collusion or fraud. I agree to abide by all terms and conditions of the bid, and certify that I am authorized to sign for the applicant firm. *Please print the following and sign your name.*

Amount of Base Bid	$ _____
10% Contingency *Contingency is not guaranteed.*	$ _____
Total Contract Sum (Amount of Bid + Contingency)	$ _____

Any contingency items shall be communicated by written change order and shall be approved by both the Owner and Contractor.

Total Contract Sum of Bid in Words: _____

_____

_____

The **BIDDER** must submit a bid on all items contained in specification or the bid shall be considered irregular. The **OWNER** reserves the right to accept or reject the bid. The **OWNER**, or his representative, further reserves the unqualified right to determine whether any particular item or items or materials, equipment, or whatsoever is an approved equal, and reserves the unqualified right to a final decision regarding the approval or rejection of the same. The bid selection shall be based on the apparent low bidder for the **"TOTAL CONTRACT SUM"**.

Add'l Documents Included:

- ☐ **Bid Form**
- ☐ **Bid Bond/Check**
- ☐ **References**
- ☐ **Public Entity Crimes**
- ☐ **License(s) copies**
- ☐ **Drug Free Workplace**
- ☐ **No-Bid**
- ☐ **Page 22, Signature/Seal**
- ☐ **Addenda Affidavit**
- ☐ **E-Verify**
- ☐ **Non Collusive**
- ☐ **Certification re: Debarment, Suspension, Ineligibility & Voluntary Exclusion**

NAME, ADDRESS, AND SIGNATURE OF BIDDER:

NAME: _____ **TITLE:** _____

ADDRESS: _____

PHONE: _____ **FAX:** _____

E-MAIL ADDRESS: _____

BIDDER SIGNATURE: _____ **DATE:** _____

Corporate Seal or Notarization below date

BID REQUIREMENTS

Bid documents, plans, addendums can be viewed and downloaded from **OPENGOV** at https://www.https://procurement.opengov.com/portal/zephyrhillsfl A link to **OPENGOV** can be found on the City's Website, www.ci.zephyrhills.fl.us, Click on Government, Purchasing, **OPENGOV**, SIGNUP and you will be able to follow our solicitation activity after signup. It is your responsibility to ensure you have downloaded all addendums published before the bid opening. You must be a registered vendor for the City of Zephyrhills. Registration is FREE. Your response and all required documentation are to be **submitted through OPENGOV electronically before the date and time listed for responses**.

Bid Bond: There are two methods of providing your solicitation bid bond. The **first** and preferred method is by an EBond which can be electronically uploaded with your solicitation response. The **second** method is to provide a certified check and deliver it to City Hall, 5335 8th Street, Zephyrhills, Florida 33542 before the deadline. Shall be for an amount not less than five percent (5%) of the total bid price and shall be made payable to the City as a guarantee that the Bidder will not withdraw his bid for a period of forty-five (45) days after bid closing time.

The Bid Bond (EBond or Certified Check) provides as a guarantee that if the bid proposal is accepted, the bidder will executed and execute the contract and furnish a Payment and Performance Bond at least equal to one hundred percent (100%) of the contract price within ten (10) days after Notice of Award of the contract.

The bid package language accommodates for all types of services and/or purchases.

TELE/PRE-CONFERENCE: This tele/pre-conference meeting is non-mandatory but **strongly** recommended to discuss the requirements of this solicitation. This has been scheduled for **Monday, December 4, 2023 at 10:00 AM**. This meeting will assure all bidders share the same information and have a fair opportunity to bid this project. It is recommended all vendors visit the locations to look at the requirements listed in this solicitation.

GoTo Link: **https://meet.goto.com/159259221**
Phone: **+1(224)501-3412**
Access Code: **159-259-221**

You may need to type the link as cutting/pasting may not work.

Payment and Performance Bond and All Insurance Shall be Secured from or Countersigned by an Agency or Surety Company Recognized in Good Standing and Authorized to do Business in the State of Florida. If at any time the Owner for justifiable cause shall be or become dissatisfied with any Surety, then upon the Performance of Payment Bonds, the Contractor/Vendor shall within ten (10) days after notice from the Owner, substitute an acceptable bond (or Bonds) in such form and sum and signed by such other Surety or Sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor/Vendor. No further payments shall be deemed due and shall not be made until new Surety or Sureties shall have furnished such an acceptable bond to the Owner.

Indemnity: Contractor/vendor shall defend, indemnify and hold harmless the City of Zephyrhills and all of the City of Zephyrhills's officers, agents, and employees from and against all claims, liability, loss and expense, including reasonable costs, collection expenses, attorneys' fees, and court costs which may arise because of the negligence (whether active or passive), misconduct, or other fault, in whole or in part (whether joint, concurrent, or contributing), of contractor/vendor, its officers, agents or employees in performance or non-performance of its obligations under the Agreement generated from this solicitation. Contractor/vendor recognizes the broad nature of this indemnification and hold harmless cause, as well as the provision of a legal defense to the City of Zephyrhills when necessary, and voluntarily makes this covenant and expressly acknowledges the receipt of such good and valuable consideration provided by the City of Zephyrhills in support of these indemnification, legal defense and hold harmless contractual obligations in accordance with the laws of the State of Florida. This clause shall survive the

termination of the Agreement from this solicitation. Compliance with any insurance requirements required elsewhere within the Agreement shall not relieve the contractor/vendor of its liability and obligation to defend, hold harmless and indemnify the City of Zephyrhills as set forth in this article of the Agreement.

It is further agreed that liability and exposure for indemnification (including, but not limited to the amounts of any indemnification owed by a governmental entity) will be limited to and governed by the provisions of Section 768.28(5), Florida Statutes.

Exparte Communication: Please note that to insure the proper and fair evaluation of a bid proposal, the City of Zephyrhills prohibits exparte communication (i.e., unsolicited) initiated by a bidder to the City official or employee evaluating or considering the bids prior to the time a bid decision has been made. Any communication between bidder and the City will be initiated by the appropriate City official or employee inorder to obtain information or clarification needed to develop a proper and accurate evaluation of the bid. Any exparte communication may be grounds for disqualifying the offending bidder from consideration or award of the proposal then in evaluation or any future proposal.

INSTRUCTIONS TO BIDDERS

1. ***Proposals***: Responses/Proposals will be submitted through BidNet Direct meeting all requirements listed for furnishing all transportation, labor, material and equipment, and performing all operations required for the construction and completion of the work herein specified and shown on the drawings.

2. ***Additional Information or Clarification***: Request for additional information or clarifications must be made in writing and can be e-mailed to kmiller@ci.zephyrhills.fl.us or through BidNet Direct (preferred). Any request for additional information or clarification must be received in writing **no later than Friday, December 29, 2023 by 10:00 A.M.**

3. ***Equivalent Brand Names***: When the City does not wish to rule out other competitor's brands or makes, the phrase "OR EQUIVALENT" is specified. Whenever a material, article or piece of equipment is identified on the plans or in the specifications by reference to manufactures' or vendors' names, trade names, catalogue numbers, etc, it is intended merely to establish a standard; and, any material, article or equipment of other manufacturers and vendors that will perform adequately the duties imposed by the general design and will be considered equally acceptable provided the material, article or equipment so proposed, is, in the opinion of the Architect/Engineer, of equal substance and function. It shall not be purchased or installed by the Contractor/Vendor without the Architect/Engineer's written approval. However, if a product other than the specified bid, it is the bidder's responsibility to identify such product in its bid, and prove to the City that said product is equal to or better than the product specified. The City shall have the sole and absolute discretion to

   determine whether the product identified by the bidder is equal to or better than the product specified by the City. Manufacturers' certificates of specifications conformance of materials may be required by the City; these certificates shall be furnished at no cost to the City. Unless otherwise specified, evidence in the form of samples may be requested if the proposed brand is other than specified by the City. If samples should be requested, such samples must be received by the City within the time specified after a formal request is made. Any items which fall into this category are to be submitted to the City for review and approval no later **than Friday, December 29, 2023 by 10:00 A.M.**

4. ***Bidder***: A bidder is an individual, firm, or corporation submitting a Proposal to the City for the work contemplated.

5. ***Response Forms***: The bidder shall submit his Proposal on the forms furnished herewith. The blank spaces shall be filled in correctly for each lump sum item and for every item for which a quantity is given. The bidder shall state the price, typewritten or printed in ink, for which he proposes to do each item of work called for.

6. ***Signature on Response***: The bidder must sign his Response correctly. If the response is made by an individual, he shall sign and his name and his post office address shall be shown. If made by a firm or partnership, signature shall be by a general partner and the name and post office address of each member of the firm or partnership shall be shown. If made by a corporation, the person signing the Response shall show the name of the state under the laws of which the corporation was chartered, also the name and business address of its president, secretary and treasurer. The Response shall bear the seal of the corporation attested by the secretary. Anyone signing the Response as agent shall file with the Response legal evidence of his authority to do so.

7. ***Familiarity with Laws***: The bidder is assumed to be familiar with all Federal, State and local laws, ordinances, rules and regulations that in any manner affect the work. Ignorance on the part of the bidder will in no way relieve him from responsibility.

8. ***Examination of Drawings, Specifications and Site of Work***: The bidder shall visit the site of the proposed work and familiarize himself with the nature and extent of the work and all local conditions that may in any manner affect the work to be done and the equipment, materials and labor required. By submitting his bid, the bidder acknowledges that he has visited the site and that he is otherwise familiar with the nature and extent of the work and all local conditions that may in any manner affect the work to be done and the equipment, material and labor required. He is required to examine carefully the drawings and specifications and Form of Agreement and Bond and to inform himself accurately and completely regarding any and all conditions and requirements contained herein that may in any manner affect the work to be performed.

9. ***Qualifications of Bidders***: The contract(s), if awarded, will be awarded only to a responsible contractor/vendor who is qualified by experience to do/supply the work specified herein. The bidder shall submit with his Proposal evidence satisfactory to the City, of his experience in like work and when requested he shall show that he has prepared the necessary organization, capital, equipment and machinery to complete the work to the satisfaction of the City within the time limit stated in the Contract Documents.

10. ***Disqualification of Bidders***: No bidder shall submit more than one proposal, and reasonable grounds for believing that a bidder interested in more than one Proposal for the same work will cause rejection of all Proposals in which such bidder, or bidders, are believed to be interested. Any or all Proposals will be rejected if there is reason to believe that Collusion exists among the bidders and no participants in such collusion will be considered in future Proposals for the same work.

11. ***Right to Reject Submittal Response***: Right is reserved to reject any or all Proposals and to disregard technical errors.

12. ***Return of Guaranty***: As soon as the bids have been compared, the City may, at its discretion, return the guaranty deposit accompanying such Proposals as in its judgment would not likely be considered in making the award. All other proposal guaranties will be held until the Agreement and Bond have been executed, after which they will be returned to the respective bidders.

13. ***Execution of the Agreement***: The individual, firm or corporation to which the contract has been awarded shall sign the necessary Agreement with the City, and return it to the City within **ten (10)** days. No contract shall be considered binding upon the City until it has been properly executed.

14. ***Failure to Execute the Agreement***: Failure on the part of the successful bidder to execute the Agreement as required will be just cause for the annulment of the award, and in the event of the annulment of the award, the Bidder shall forfeit his bid bond. This forfeiture shall not be construed as a penalty, but as reasonable, fixed and liquidated damages because of the Bidder's failure to enter into Agreement with the City. The award may then be made to the next lowest acceptable bidder, or the work re-advertised as the City may elect.

15. ***Withdrawal of Response***: A bidder may withdraw his Proposal without prejudice to himself, not later than the day and hour set for opening of bids, by communicating his purpose in writing to the City and his Proposal will be returned to him unopened.

16. ***Interest of Member of or Delegate to Congress***. No member of or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this contract or any benefit that may arise therefrom, but this provision shall be construed to extend to this contract if made with a corporation for its general benefit.

17. ***Basis of Award***: Considerations will be given to price, experience of the bidder in this type of work, and their conformity with the specifications. Except where the City exercises the right reserved herein to reject any or all bids and subject to the restrictions stated hereinabove, the Contract shall be awarded by the City to the responsible Bidder who has submitted either the lowest responsive bid, or the lowest responsive bid on the base bid including such alternates/optional items as the City determines to be in its own best interests, and application of any preferences, as applicable. The quality of the material to be supplied, their suitability to requirements, and guarantee clauses shall be taken into consideration. No significant deviation for the term of this specification is acceptable. The City of Zephyrhills reserves the right to reject any or all bids as authorized by law, to accept in whole or in part any such bid, and to award the contract to other than the lowest bidder at its discretion, if the best interest of the City of Zephyrhills is thereby served.

18. ***Award of Contract***: The City reserves the right to reject any or all bids, or any part of any bid, to waive any informality in any bid, or to re-advertise for all or part of the work contemplated. The City reserves the right, prior to award of Contract, to add to the scope of the project any item or any combination of items which may exceed the total bid price for the project.

    Considerations will be given to price, experience of the bidder in this type of work, and their conformity with the specifications. Awards will be made to the lowest responsible bidder. The quality of the material to be supplied, their suitability to requirements, and guarantee clauses shall be taken into consideration. No significant deviation for the term of this specification is acceptable. The City of Zephyrhills reserves the right to reject any or all bids as authorized by law, to accept in whole or in part any such bid, and to award the contract to other than the lowest bidder at its discretion, if the best interest of the City of Zephyrhills is thereby served.

    A pre-construction meeting shall take place after the award of the contract. This meeting is mandatory pre-construction meeting. The attendees of this meeting shall be the Contractor and City Staff.

    In the event the contract is awarded to this Bidder, he will enter into a formal written agreement with the City in accordance with the accepted bid within ten (10) calendar days after said contract is submitted to him. The Bidder further agrees that in the event of the Bidder's default or breach of any of the agreements of this proposal, the said bid deposit shall be forfeited as liquidated damages.

    If awarded this contract, It is hereby understood and mutually agreed, by and between the Contractor/Vendor and the Owner, that the date of beginning and the time for completion as specified

in the contract of the work to be done hereunder are ESSENTIAL CONDITIONS of this contract; and it is further mutually understood and agreed that the work embraced in this contract shall be commenced on a date to be specified in the "Notice to Proceed."

It is further agreed where under the contract an additional time is allowed for the completion of any work, the time limit fixed by such extension shall be of the essence of this contract. Provided, that the Contractor/Vendor shall not be charged with liquidated damages or any excess cost when the Owner determines that the Contractor/Vendor is without fault and the Contractor's or Vendor's reason for the time extension is acceptable to the Owner: Provided, further, that the Contractor/Vendor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

(a) To any preference, priority or allocation order duly issued by the Government.
(b) To any delays of Subcontractors or suppliers occasioned by any of the causes specified in subsection (a).

Provided, further, that the Contractor/Vendor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor/Vendor within a reasonable time of its decision in the matter.

The Contractor/Vendor agrees that said work shall be prosecuted regularly, diligently, and uninterrupted at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor/Vendor and the Owner, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality. The Bidder agrees to supply all materials within thirty (30) days after successful agreement has been signed by both parties and after contract has been submitted to them and receipt of Notice to Proceed.

If the said Contractor/Vendor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor/Vendor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner the amount

specified in the contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor/Vendor shall be in default after the time stipulated in the contract for completing the work

Should the contractor/vendor fail to substantially complete and supply the materials listed under this contract and make it available for beneficial use on or before the date stipulated for completion (or such later date as may result from extension of time granted by City), he shall pay the City, as liquidated damages, the sum of **$1000.00** for each consecutive calendar day that terms of the contract remain unfulfilled beyond date allowed by the contract, which sum is agreed upon as a reasonable and proper measure of damages which City will sustain per diem by failure of Contractor/vendor to supply the materials within the time stipulated; it being recognized by City and Contractor/vendor that the injury to City which could result from a failure of Contractor/vendor to complete on schedule is uncertain and cannot be computed exactly. In no way shall costs for liquidated damages be construed as a penalty.

Any notice to any Contractor/Vendor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted, by

certified or registered mail, to the said Contractor/Vendor at his last given address or delivered in person to the said Contractor/Vendor or his authorized representative on the work.

19. ***Conditions***: The bidder shall list on a separate sheet of paper any variations from, or exceptions to, the conditions and specifications of this bid. This sheet shall be labeled "Exceptions to Bid Conditions and Specifications", and shall be attached to the bid. Any variations or exceptions shall meet or exceed the plans and specifications.

20. ***Quantities***: An estimate of the quantities of work to be done and/or materials to be furnished is given in the specifications. It is the result of the City's calculations and is believed to be correct. It is given only as a basis of comparison of bids and the City does not expressly or by implication agree that the actual quantities involved will correspond exactly therewith; nor shall the bidder plead misunderstanding or deception because of such estimates of quantities, or of the character, location, or other conditions pertaining to the work performed or materials furnished in accordance with the plans and specifications. It is understood that the quantities may be increased or decreased without in any way invalidating the unit bid prices.

21. ***Public Records***: In accordance with 119.0701 F.S. Contractor shall:

IF CONSULTANT OR CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONSULTANT'S OR CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT OR CONTRACT, THEY SHALL CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:

LORI HILLMAN, CITY CLERK
CITY OF ZEPHYRHILLS
5335 8TH STREETH
ZEPHYRHILLS, FLORIDA 33542
LHILLMAN@CI.ZEPHYRHILLS.FL.US
813-780-0000

22. ***Correction of Work***. All work, all materials, whether incorporated in the work or not, all processes of manufacture, and all methods of construction shall be at all times and places subject to the inspection of the Architect/Engineer who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture, and methods of construction for the purposes for which they are used. Should they fail to meet his approval they shall be forthwith reconstructed, made good replaced and/or corrected, as the case may be by the Contractor/Vendor at his own expense. Rejected materials shall immediately be removed from the site. If, in the opinion of the Architect/Engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor/Vendor hereunder shall be reduced by such amount as in the judgment of the Architect/Engineer shall be equitable.

23. ***Subsurface Conditions Found Different***. Should the Contractor/Vendor encounter sub-surface and/or latent conditions at the site materially differing from those shown on the Plans or indicated in the Specifications, the Contractor/Vendor shall immediately give notice to the Architect/Engineer of such conditions before they are disturbed. The Architect/Engineer will thereupon promptly investigate the conditions, and if he finds that they materially differ from those shown on the Plans

or indicated in the specifications he will at once make such changes in the Plans and/or Specifications as the Contractor/Vendor may find necessary, any increase or decrease of cost resulting from such changes to be adjusted in the manner provided in Paragraph 17 of the General Conditions.

24. ***Claims for Extra Cost.*** No claim for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Architect/Engineer approved by the Owner, as aforesaid, and the claim presented with the first estimate after the changed or extra work is done. When work is performed under the terms of subparagraph 17 of the General Conditions, the Contractor/Vendor shall furnish satisfactory bills, payrolls, and vouchers covering all items of cost and when requested by the Owner, give the Owner access to accounts relating thereto.

25. ***Termination (Cause and/or Convenience).***

a. This contract may be terminated in whole or in part in writing by either party in the event of substantial failure by the other party to fulfill its obligations under this contract through no fault of the terminating party, provided that no termination may be effected unless the other party is given (1) not less than ten (10) calendar days written notice (delivered by certified mail, return receipt requested) of intent to terminate and (2) an opportunity for consultation with the terminating party prior to termination.

b. This contract may be terminated in whole or in part in writing by the local government for its convenience, provided that the other party is afforded the same notice and consultation opportunity specified in 1(a) above.

c. If termination for default is effected by the local government, an equitable adjustment in the price for this contract shall be made, but (1) no amount shall be allowed for anticipated profit on unperformed services or other work, and (2) any payment due to the contractor/vendor at the time of termination may be adjusted to cover any additional costs to the local government because of the contractor's or vendor's default.

If termination for convenience is affected by the local government, the equitable adjustment shall include a reasonable profit for services or other work performed for which profit has not already been included in an invoice.

For any termination, the equitable adjustment shall provide for payment to the contractor/vendor for services rendered and expenses incurred prior to receipt of the notice of intent to terminate, by the contractor/vendor relating to commitments (e.g., suppliers, subcontractors) which had become firm prior to receipt of the notice of intent to terminate.

d. Upon receipt of a termination action under paragraphs (a) or (b) above, the contractor/vendor shall (1) promptly discontinue all affected work (unless the notice directs otherwise) and (2) deliver or otherwise make available to the local government all data, drawings, reports specifications, summaries and other such information, as may have been accumulated by the contractor/vendor in performing this contract, whether completed or in process.

e. Upon termination, the local government may take over the work and may award another party a contract to complete the work described in this contract.

f. If, after termination for failure of the contractor/vendor to fulfill contractual obligations, it is determined that the contractor/vendor had not failed to fulfill contractual obligations, the termination shall be deemed to have been for the convenience of the local government. In such event, adjustment of the contract price shall be made as provided in paragraph (c) above.

PRELIMINARY MATTERS

Delivery of Bonds: Simultaneously with the execution and delivery of the Agreement, the Contractor/Vendor shall deliver to the City the required executed Bonds. Additional copies will be furnished, upon request, at the cost of reproduction.

Before Starting Work: Before starting the work at the site, the Contractor/Vendor shall furnish the City with certificates of insurance and schedules as required by the City and a conference will be held to review the above schedules, to establish procedures for handling Applications for Payment and to establish a working understanding between the parties as to the Project. Present at the conference will be the City and its representative, the Contractor/Vendor and his Superintendent.

The Contractor/Vendor shall furnish a list of key personnel within **fifteen (15)** calendar days of starting construction. This list should include the superintendent, all personnel at the site and their assignments, name, title, telephone numbers (work and cellular) along with email addresses.

Before undertaking the Work, the Contractor/Vendor shall carefully study and compare the Contract Documents and check and verify all figures shown thereon and all field measurements. He shall at once report in writing to the City any conflict, error or discrepancy which he may discover. The Contractor/Vendor assumes full responsibility for having familiarized himself with the nature and extent of the Contract Documents, Work, locality and local conditions that may in any manner affect the Work to be done and represents that he has visited the site.

The City shall give the Contractor/Vendor a written Notice to Proceed, stating a date on which it is expected that the Contractor/Vendor will start the work. No work shall be done prior to the date on which the Work is to start.

The Contractor/Vendor Time shall commence to run on the date of the Notice to Proceed.

CORRELATION, INTERPRETATION, AND INTENT OF CONTRACT DOCUMENTS

For Construction: It is the intent of the Specifications and Drawings to describe a complete Project to be constructed in accordance with the Contract Documents. The Contract Documents comprise the entire Agreement between the City and the Contractor/Vendor. They may be altered only by a Modification. The Contract Documents cover, with explicit provisions, all matters relating to the work which the Contractor/Vendor undertakes to construct or perform in full compliance with such provisions. It is understood that the Contractor/Vendor has, by personal examination and inquiry, if necessary, satisfied himself as to all local conditions and as to the meaning, requirements and reservations of the Contract Documents. No deviation will be allowed from the City's interpretation thereof. The intent of the Contract Documents is to include all labor, materials, equipment, and transportation necessary for the proper execution of the work. The Contractor/Vendor shall make plural and complete all work which, to

avoid needless repetition or for the sake of brevity, has been shown singly or partially indicated. The Contractor/Vendor shall follow the Drawings and execute all work in strict accordance therewith and with the kind and quality of materials indicated and specified. Materials or work described in words which, when so applied, have a well-known technical or trade meaning shall be held to refer to such recognized standards. Any deviation from Specifications, which may be required by the exigencies of construction, shall in all cases conform to written instructions of the City. The applicable provisions of the Contract Documents shall apply with equal force to all work, including extra work, performed under this Contract, whether performed either directly by the Contractor/Vendor or by any Subcontractor.

The Contract Documents are complementary; what is called for by one is as binding as if called for by all. If the Contractor/Vendor finds a conflict, error or discrepancy in the Contract Documents, he shall call it to the City's attention in writing before proceeding with the Work affected thereby. In resolving such conflicts, errors and discrepancies, the documents shall be given precedence in the following order: Agreement, Special Conditions, General Conditions, Specifications, including any Addenda, Drawings,

Invitation to Bid and Contractors/Vendors Bid. Any work that may reasonably be inferred from the Specifications or Drawings as being required to produce the intended result shall be supplied whether or not it is specifically called for. Work, materials or equipment described in words which so applied have a well-known technical or trade meaning shall be deemed to refer to such recognized standards.

Insurance: Contractor/vendor shall, at its sole cost and expense, procure and maintain throughout the term of the contract, Comprehensive General Liability and Worker's Compensation insurance, including Employer Liability insurance, with minimum policy limits of $1,000,000 (this could be $2,000,000 depending on the amount of the contract) combined Single Limits, or to the extent and in such amounts as required and authorized by Florida law, and will provide endorsed certificates of insurance generated and executed by a licensed insurance broker, brokerage or similar licensed insurance professional evidencing such coverage, and naming the City of Zephyrhills as a named, additional insured, as well as furnishing the City of Zephyrhills with a certified copy, or copies, of said insurance policies. Certificates of insurance and certified copies of these insurance policies must accompany the signed contract. Said insurance coverages procured by the contractor/vendor as required herein shall be considered, and the contractor/vendor agrees that said insurance coverages it procures as required herein shall be considered, as primary insurance over and above any other insurance, or self-insurance, available to the City of Zephyrhills, and that any other insurance, or self-insurance available to the City of Zephyrhills shall be considered secondary to, or in excess of, the insurance coverage(s) procured by the contractor/vendor as required.

Nothing shall be construed to extend the City of Zephyrhills's liability beyond that provided in section 768.28, Florida Statutes.

Builders' Risk Coverage: ***For any contracts that may apply to the following in the first sentence should also include statement below.*** If this solicitation includes: (1) construction of a new above-ground structure or structures, or (2) any addition(s), improvement(s), alteration(s), or repair(s), to an existing above-ground structure or structures, or (3) the installation of machinery or equipment into an existing structure or structures, the Contractor shall provide, in a policy acceptable to the City, "all risk" (i.e., Special Form) property insurance on any such construction, additions, machinery or equipment. The amount of the insurance shall be no less than the estimated replacement value at the time of the City's final acceptance of such new structures, addition(s), improvement(s), alternation(s), repair(s), machinery or equipment. The coverage shall not be subject to any restriction with respect to occupancy or use by the City and, subject to thirty (30) days' prior written notice to the City shall remain in full effect until final acceptance by the City. In addition, the City, the Professional, and the Contractor's subcontractors of any tier, shall be additional insureds on this policy. The insurance shall include a deductible no greater than one percent (1%) of the Contract amount, or $25,000, whichever is smaller, for which the Contractor

shall be responsible. The risk of loss whether insured or not shall remain with the Contractor until final acceptance. Upon request, Contractor shall furnish to the City complete copies of the insurance policy.

Liens: The Contractor/vendor shall indemnify and save harmless the City from all claims, demands, causes of action, suits of whatever nature arising out of the services, labor, and materials furnished by the Contractor/Vendor or its Subcontractors under this Contract, and from all laborers', materialmen's and mechanics' liens upon the property which the work is located arising out of the services, labor, and materials furnished by the Contractor/Vendor or any of its Subcontractors under this Contract; and shall keep said property free and clear of all liens, claims, and encumbrances arising from the performance of this Contract by the Contractor/Vendor or its Subcontractors; the Contractor/Vendor hereby waiving all rights to claim such lien on the City's properties.

If required, the Contractor/Vendor shall furnish at the City's option either (a) a good and sufficient release or waiver of lien from itself, every subcontractor, materialman, laborer, and other person furnishing services, labor, or materials in connection with the work or (b) receipts in full, together with an affidavit that the receipts cover all the services, labor, and materials furnished by the Contractor/Vendor or its Subcontractors for which a lien might be filed except as covered by the releases and waivers of liens; but if any Subcontractor, laborer, materialman, or other person refuses to furnish a waiver or release a receipt in full, the Contractor/Vendor may furnish a Bond satisfactory to the City to indemnify the City against any claim or lien or otherwise. (c) Surety Bond may be furnished by the Contractor/Vendor or his Surety as a guarantee that he will execute the work in accordance with the terms of the Contract, and that he shall make all payments for all labor, materials and supplies directly or indirectly for the work. If Surety Bond is required by the City, Contract price will be increased by an amount equal to the cost of securing said Bond.

Definitions: The following terms are respectively defined as follows:

- Contractor/Vendor: A person, firm or corporation with whom the contract is made by the Owner/City.
- Subcontractor: A person, firm or corporation supplying labor and materials or only labor for at the site of the project for, and under separate contract or agreement with the Contractor/Vendor.
- Work on (at) the Project: Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the Contractor and any subcontractor.
- Owner: Can represent the City of Zephyrhills and/or property/business owners.

CONTRACTOR'S or VENDOR's RESPONSIBILITIES

Supervision and Superintendence: The Contractor/Vendor shall supervise and direct the Work efficiently and with his best skill and attention. He shall be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor/Vendor shall be responsible to see that the finished Work complies accurately with the Contract Documents. The Contractor/Vendor shall accept full responsibility for the work until final acceptance. He shall protect the work against all loss or damage sustained during the progress of the work and promptly repair any damage done from any cause whatsoever. After acceptance of the work, Contractor's or Vendor's responsibility shall extend to defective or faulty work as later defined in these specifications.

The Contractor/Vendor shall keep on the Work site at all times during its progress, a competent resident superintendent who shall not be replaced without written consent of the City, under extraordinary circumstances. The Superintendent will be the Contractor's or Vendor's representative at the Site and

shall have the authority to act on behalf of the Contractor/Vendor. He shall be present at the pre-construction conference. All communications given to the Superintendent shall be as binding as if given to the Contractor/Vendor.

Labor, Materials, Equipment, and Manufactured Articles: The Contractor/Vendor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. He shall at all times maintain good discipline and order at the site.

The Contractor/Vendor shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities, and all other facilities and incidentals necessary for the execution, testing, and initial operation and completion of the Work. Any work necessary to be performed after regular working hours, on Sunday or legal holiday, shall be performed without additional expense to the City.

All materials and equipment shall be new, except as otherwise provided in the Contract Documents. If required by the City, the Contractor/Vendor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. All material and workmanship shall in every respect, be in accordance with what, in the opinion of the City, is in conformity with approved modern practice.

Contractor's or Vendor's Title to Materials: No materials or supplies for the work shall be purchased by the Contractor/Vendor or by any Subcontractor subject to any chattel mortgage or under a conditional sale contractor/vendor or other agreement by which an interest is retained by the seller. The Contractor/Vendor warrants that he has good title to all materials and supplies used by him in the work, free from all liens, claims or encumbrances.

Request for Information (RFI): Immediately on discovery of the need for additional information the Contractor/Vendor shall submit a RFI to the Owner's representative, Project Manager.

Use of Premises: The Contractor/Vendor shall confine his equipment, the storage of materials and equipment and the operations of his workmen to areas permitted by law, ordinances, or permits and shall not unreasonably encumber the premises with materials or equipment. Materials stored without proper permits shall be promptly relocated upon request by the City at the Contractor's or Vendor's expense.

Record Drawings: The Contractor/Vendor shall keep one record copy of all Specifications, As-built Drawings, Addenda, Modifications and Shop Drawings at the site in good order and annotated to show all changes made during the construction process. These shall be available to the RPR and the Engineer. As-builts shall be delivered to them for the City and Engineer upon completion of the Project. Release of retainage shall be contingent upon delivery of red-lined "as-builts".

Supplementary Drawings: When, in the opinion of the City, it becomes necessary to explain more fully the work to be done, or to illustrate the work further, or to show any changes which may be required, drawings, known as supplementary drawings, with specifications pertaining thereto, will be prepared by the Engineer.

The additional drawings and instructions supplied to the Contractor/Vendor will coordinate with the Contract Documents and will be prepared that they can be reasonably interpreted. The Contractor/Vendor shall carry out the work in accordance with the additional detail drawings and instructions. The Contractor/Vendor and the Architect/Engineer will prepare jointly: (a) a schedule, fixing the dates at which special detail drawings will be required, such drawings, if any, to be furnished by the Architect/Engineer in accordance with said schedule, and (b) a schedule fixing the respective dates for the submission of shop drawings; the beginning of manufacture, testing and installation of materials, supplies and equipment; and the completion of the various parts of the work; each such schedule to be

subject to change from time to time in accordance with the progress of the work The supplementary drawings shall be binding upon the Contractor/Vendor with the same force as the drawings. Where such supplementary drawings require either less or more than the estimated quantities of work, credit to the City or compensations therefore to the Contractor/Vendor shall be subject to the terms of the agreement.

Shop or Setting Drawings: The Contractor/Vendor shall submit promptly to the Architect/Engineer four (4) copies of each shop or setting drawing prepared in accordance with the schedule predetermined as aforesaid. After examination of such drawings by the Architect/Engineer and the return thereof, the Contractor/Vendor shall make such corrections to the drawings as have been indicated and shall furnish the Architect/Engineer with four (4) corrected copies. If requested by the Architect/Engineer the Contractor/Vendor must furnish additional copies. Regardless of corrections made in or approval given to such drawings by the Architect/Engineer, the Contractor/Vendor will nevertheless be responsible for the accuracy of such drawings and for their conformity to the Plans and Specifications, unless he notifies the Architect/Engineer in writing of any deviations at the time he furnishes such drawings.

Architect/Engineer's Authority: The Architect/Engineer shall give all orders and direction contemplated under the contract and specifications, relative to the execution of the work. The Architect/Engineer shall determine the amount, quality, acceptability, and fitness of the several kinds of work and materials that are to be paid for under this contract and shall decide all questions which may arise in relation to said work and the construction thereof. The Architect/Engineer's estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties hereto relative to said contract or specifications; the determination or decision of the Architect/Engineer shall be a condition precedent to the Contractors/Vendors to receive any money or payment for work under this contract affected in any manner or to any extent by such question.

The Architect/Engineer shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work that may arise between the contractor/vendor under this contract and other Contractors/Vendors performing work for the City shall be adjusted and determined by the Architect/Engineer.

Safety and Protection: The Contractor/Vendor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. He shall take all necessary precautions for the safety of and shall provide the necessary protection to prevent damage, injury or loss to:

All employees on the Work and other persons who may be affected thereby.

All the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site.

Other property, including City property, at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The Contractor/Vendor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in the contract or by the City, or his duly authorized representatives. He shall notify the Architect/Engineer immediately. Any claim for compensation by the Contractor/Vendor shall be promptly submitted to the Architect/Engineer for approval.

The Contractor/Vendor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's Superintendent unless otherwise designated in writing by the Contractor/Vendor to the City.

SAFETY PLAN

A. It is the contractor's or vendor's responsibility to comply with OSHA standards and all regulations pertaining to the work including confined space entry.

B. Precaution shall be exercised at all times for the protection of persons and property. The safety provisions of applicable laws, and existing building and construction codes shall be guarded in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractor of America, and OSHA's Safety and Health Standards (29 CFR 1926/1910) U.S. Department of Labor, to the extent that such provisions are not in contravention of applicable law.

C. ***Safety Requirements***:

1. The Contractor/Vendor shall provide documentation on Means of Egress, Emergency Evacuation, Confined Space Entry, Lock Out – Tag Out, Hot Work Permit, Hurricane Preparedness, Right-to-Know / MSDS Sheets to the satisfaction of the City prior to commencement of any single job.
2. A Contractor/Vendor Process Safety Management Briefing will be held at the Pre-Construction Conference. The Contractor/Vendor will be required to attend this briefing and sign a form so stating that he has been briefed. A copy of this form is included in the Forms section of this package.

Trench Safety Act: Each contractor must submit with his bid an executed sworn certification that he will comply with the Trench Safety Act, Chapter 90-96, Florida Statues, on trench safety.

Emergencies: In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor/Vendor, without special instruction or authorization from the City, is obligated to act, at his discretion, to prevent threatened damage, injury or loss.

Assignability. The Contractor/Vendor shall not assign the whole or any part of this contract or any monies due or to become due hereunder without written consent of the Owner. In case the Contractor/Vendor assigns all of any part of any monies due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that right of the assignee in and to any monies due or to become due to the Contractor/Vendor shall be subject to prior claims of all persons, firms and corporations of services rendered or materials supplied for the performance of the work called for in this contract.

Mutual Responsibility of Contractors/Vendors. If, through acts of neglect on the part of the Contractor/Vendor, any other Contractor/Vendor or any subcontractor shall suffer loss or damage on the work, the Contractor/Vendor agrees to settle with such other Contractor/Vendor or subcontractor by agreement or arbitration if such other Contractor/Vendor or subcontractor will so settle. If such other Contractor/Vendor or subcontractor shall assert any claim against the Owner or account of any damage alleged to have been sustained, the Owner shall notify the contractor/vendor, who shall indemnify and save harmless the Owner against any such claim.

Subcontractors: The Contractor/Vendor shall not employ any Subcontractor against whom the City may have reasonable objection, nor will the Contractor/Vendor be required to employ any Subcontractor against whom he has reasonable objection. Within 30 calendar days after the date of the Award of

Contract and before the City shall make any partial payments to the Contractor/Vendor, the Contractor/Vendor shall furnish to the City in writing for acceptance by the City a list of the names of the Subcontractors proposed for the principal portions of the work. The Contractor/Vendor shall not make any substitution for any Subcontractor who has been accepted by the City, unless the City determines that there is good cause for doing so.

The Contractor/Vendor shall be fully responsible for all acts and omissions of his Subcontractors and of persons directly or indirectly employed by them and of persons for whose acts any of them may be liable to the same extent that he is responsible for the acts and omissions of persons directly employed by him. Nothing in the Contract Documents shall create any contractual relationship between any Subcontractor and the City or any obligation on the part of the City to pay or to see to the obligation on the part of the City to pay or to see to the payment of any moneys due any Subcontractor, except as may otherwise be required by law. The City may furnish to any Subcontractor, to the extent practicable, evidence of amounts paid to the Contractor/Vendor on account of specific work done in accordance with schedule of values.

The divisions and sections of the Specifications and the identifications of any Drawings shall not control the Contractor/Vendor in dividing the work among Subcontractors or delineating the work to be performed by any specific trade.

The Contractor/Vendor agrees to bind specifically every Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the City. The terms of the Contract Documents shall control over any discrepancy in any other document.

Laws and Regulations: The Contractor/Vendor shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the work. If the Contractor/Vendor observes that the Specifications or drawings are at variance therewith, he shall give the City prompt written notice thereof, and any necessary changes shall be adjusted by an appropriate Modification. If the Contractor/Vendor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations and without such notice to the Engineer, he shall bear all costs arising therefrom; however, it will not be his primary responsibility to make certain that the drawings and Specifications are in accordance with such laws, ordinances, rules and regulations.

Permits and Protection of Public: The Contractor/Vendor shall be required to observe all the ordinances in relation to obtaining permits for occupying, excavating or in anywise obstructing the streets and alleys. He shall erect and maintain barricades and sufficient safeguards around all excavations, embankments or obstructions.

Where there are telephone, telegraph, light or power poles; water mains, conduits, pipe, or drains; or other construction either public or private; in or on the streets or alleys; the work shall be so conducted that no interruption or delay will be caused in the operation or use of the same. Proper written notice shall be given and all the facilities afforded the owners of such construction encountered or likely to be encountered, as will enable them to preserve the same from injury.

Unless otherwise expressly provided for in the Specifications, the City will furnish to the Contractor/vendor all surveys necessary for the execution of the work.

The Contractor/Vendor shall procure and pay all other permits, licenses and approvals necessary for the execution of this contract and shall comply with all Florida Department of Environmental Protection requirements. Cost of building permits will be paid by the contractor. ***The selected Contractor/Vendor must be registered with the City of Zephyrhills Building Department before starting the project.***

Use of Premises: The Contractor/Vendor shall confine his equipment, the storage of materials and equipment and the operations of his workmen to areas permitted by law, ordinances, or permits and shall not unreasonably encumber the premises with materials or equipment. Materials stored without proper permits shall be promptly relocated upon request by the City at the Contractor's or Vendor's expense.

Quality Control: The Contractor/Vendor shall maintain quality control over suppliers, manufacturers, products, services, site-conditions, and workmanship to assure they meet or exceed requirements of Standard and local building codes.

Cleaning: The Contractor/Vendor shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the work. The Contractor shall clean up work site, interior and exterior of building, any and all equipment or fixtures must operate properly and not show any signs of damage or any defects. At the completion of the work he shall remove all waste materials, rubbish, and debris from and about the premises as well as all tools, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by the City. The Contractor/Vendor shall restore to their original condition those portions of the site for alteration by the Contract Documents.

Protection of Work and Materials: Facilities for handling of material and inspecting the work shall at all times be furnished by the Contractor/Vendor, and all costs due to delays in handling of materials or equipment, and loss or damage, shall be at the expense of the Contractor/Vendor. The Contractor/Vendor shall be responsible for all materials, equipment and supplies sold and delivered to

the City until final inspection of the work and acceptance thereof by the City. In the event any such materials, equipment and supplies are lost, stolen, damaged or destroyed prior to receipt of delivery, Contractor/Vendor shall replace same without cost to the City.

Lands and Right-of-Way: Prior to the start of construction, the City shall obtain all lands and right-of-way necessary for the carrying out and completion of work to be performed under this contract.

Other Prohibited Interests: No official of the City who is authorized in such capacity and on behalf of the City to negotiate; make, accept or approve or to take part in negotiating, making, accepting or approving any architectural, engineering, inspection, construction or material supply contract or any subcontracting connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part hereof. No official who is authorized in such capacity and on behalf of the City to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, insurance contract, or any other contract pertaining to the project.

Construction Schedule and Periodic Estimates: Immediately after execution and delivery of the contract, and before the first partial payment is made, the Contractor/Vendor shall deliver to the City an estimated construction progress schedule in a form satisfactory to the City, showing the proposed dates of commencement and completion of each of the various subdivision of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due to the Contractor/Vendor in accordance with the progress schedule. The Contractor/Vendor shall also furnish on forms mutually agreeable to the Engineer, Contractor/Vendor and the City: (a) a detailed estimate giving a complete breakdown of the contract price, and (b) periodic itemized estimates of work done for the purpose of making partial payments therefore. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

Payments to Contractor/Vendor. (a) At the end of each calendar month during the life of the contract, the contractor/vendor will prepare an estimate of the quantities of the work completed and of the total amount due. The amount will be due on or before the 15th day of the second month following the completion of said work. (b) In preparation of monthly partial pay, estimated accounts may be taken if specifically approved by the owner of materials delivered to the site of work but not yet incorporated into the work. (c) When the work provided for by the contract has been completely performed on the part of the contractor/vendor and all parts of the work have been approved by the engineer and accepted by the owner, a final estimate will be prepared which shows the total cost of the work performed under the contract, including extra work as authorized by change orders, the total amount retained, and the total amount paid on previous partial estimates. All prior estimates upon which payments have been made are subject to necessary corrections or revisions in the final payment. All pay estimates will be reviewed for correctness by the engineer and approved by the owner before payment. NOTE: All payments will be processed by ACH/EFT processing and the contractor will need to be enrolled.

Payments by Contractor/Vendor. The Contractor/Vendor shall pay: (a) for all transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered; and (b) for all materials, tools, and other expendable equipment to the extent of ninety percent (90%) of the cost thereof, not later than the 20th day of the calendar month following that in which such materials, tools, and equipment are delivered at the site of the project, and the balance of the cost thereof, not later than the 30th day following the completion of that part of the work in or on which such materials, tools and equipment are incorporated or used; (c) to each of his subcontractors, not later than the 5th day

following each payment to the Contractor/Vendor, the respective amounts allowed the Contractor/Vendor on account of the work performed by his subcontractors to the extent of each subcontractor's interest.

Acceptance of Final Payment Constitutes Release: The acceptance by the Contractor/Vendor of final payment shall be and shall operate as a release to the City of all claims and all liability to the Contractor/Vendor for all things done or furnished in connection with this work and for every act and neglect of the City and others relating to or arising out of this work. No payment, however, final or otherwise, shall operate to release the Contractor/Vendor or his sureties from any obligations under this contract or the Performance and Payment Bond.

Decisions in Disagreements: The Engineer will be the interpreter of the terms and conditions of the Contract Documents and the judge of the performance thereunder. In his capacity as interpreter and judge, he will exercise his best efforts to ensure faithful performance by both the City and the Contractor/Vendor. He will not show partiality to either and shall not be liable for the result of any interpretation or decision rendered in good faith. Claims, disputes and other matters relating to the execution and progress of the work or the interpretation of or performance under the Contract Documents shall be referred to the Engineer for decision; which he will render in writing within a reasonable time.

Change Orders: Without invalidating the Agreement, the City may, at any time or from time to time, order additions, deletions, or revisions in the work authorized by an executed, signed Change Order. Change Orders should be submitted on an **AIA Document G701** *(exampled attached in the Forms section of this package)*. Change Orders is a defined written instrument prepared by the Contractor and signed by both Contractor and authorized City representative.

Upon receipt of an executed authorized Change Order, the Contractor/Vendor shall proceed with the work involved. All such work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment will be made.

The RPR may authorize changes or alterations in the work not involving extra cost and not inconsistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order. If the Contractor/Vendor believes that any minor change or alteration authorized by the RPR entitled him to an increase in the Contract Price, he may make a claim in writing.

The Contractor/Vendor shall not start work on any alteration requiring an increase or decrease in price or extension of time until a Change Order setting forth the adjustments is executed by the City.

It is the Contractor's or Vendor's responsibility to notify his Surety of any changes affecting the general scope of the work or change in the Contract Price and the amount of the applicable Bonds shall be adjusted accordingly. The Contractor/Vendor shall furnish proof of such adjustment to the City.

Change of Contract Time: The Contract Time may only be changed by a Change Order. Any claim for an extension in the Contract Time, shall be in writing delivered to the City within five days of the occurrence of the event giving rise to the claim. All claims for adjustment in the Contract Time shall be determined by the Engineer if the City and the Contractor/Vendor cannot otherwise agree. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.

The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of the Contractor if he makes a claim therefore as provided for. Such delays shall include, but not be restricted to, acts or neglect by any separate Contractor/Vendor employed by the City, fires, floods, labor disputes, epidemics, abnormal weather conditions, or acts of God.

All time limits stated in the Contract Documents are of the essence of the Agreement.

Whenever changes in the work are ordered by written Modification, the extension to the Contract Time, if an extension is to be allowed, shall be noted in the same written Modification.

Claims for extension of Contract Time will be approved only if the work or the event which causes the delay, affects the path of critical events of the project. In such case an extension of time will then be allowed only to equal the number of days by which this path of events is lengthened. If required by the Engineer, Contractor/Vendor shall indicate this path of critical events, by diagram or narrative, in such detail as may be necessary to justify his claim and establish the number of days' delay. The path of critical events mentioned herein is defined as that series of interdependent construction events which must be sequentially performed and which require a longer total time to perform than any other such series. Said extension shall be, as determined by the Engineer, sufficient to compensate for the detention, provided it shall have immediate notice from the Contractor/Vendor, in writing, of the cause and the probable length of the detention; however, neither an extension of any time for any reason beyond the date set herein, nor the acceptance of any work subsequent to said date, shall be deemed a waiver by the City of the right to abrogate the Contract for delay.

Weather Conditions: In the event of temporary suspension of work, or during inclement weather or whenever the Architect/Engineer shall direct, the Contractor/Vendor will and will cause his subcontractors to carefully protect his and their work and materials against damage or inquiry from the weather. If, in the opinion of the Architect/Engineer, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor/Vendor or any of his Subcontractors to protect this work, such materials shall be removed and replaced at the expense of the Contractor/Vendor.

Photographs of the Project. *If required by the Owner, the Contractor/Vendor shall furnish photographs of the project, in the quantities* as requested.

Tests and Inspections: All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Owner. The offer or payment of any compensation, whatever may be its character or form, the offer or giving of any gratuity, or the offer or granting of any valuable favor by the Contractor/Vendor to any Inspection, directly or indirectly, is strictly prohibited, and any such act on the part of the Contractor/Vendor will constitute a violation of this Contract.

If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any work to specifically be inspected, tested, or approved by someone other than the Contractor/Vendor, the Contractor/Vendor shall give the City notice of readiness therefore. The Contractor/Vendor shall furnish the City the required certificates of inspection, testing or approval. All such tests shall be in accordance with the methods prescribed by the American Society for Testing and Materials or such other applicable organization as may be required by law or the Contract Documents. If any such work required so to be inspected, tested or approved is covered without approval of the City, it shall be requested by the City, be uncovered for observation at the Contractor's or Vendor's expense. The cost of such inspections, tests, and approvals shall be borne by the Contractor/Vendor unless otherwise provided.

The City of Zephyrhills shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

Use and Occupancy Prior to Acceptance by City: The Contractor/Vendor agrees to the use and occupancy of a portion or unit of the project before formal acceptance by the City, provided the City:

A. Secures written consent of the Contractor/Vendor except in the event, in the opinion of the Architect/Engineer, the Contractor/Vendor is chargeable with unwarranted delay in final cleanup or punch list items or other contract requirements.
B. Secures endorsement from the insurance-carrier and consent of the Surety permitting occupancy of the building or use of the project during the remaining period of construction.

Acceptance: Upon completion, the project manager shall inspect the project to assure all quality control standards are in compliance with the plans and specifications contained herein. The contract retainage ten (10%) will be released for final payment upon completion of all punch list items.

Guarantee and Warranties: Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the City, shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor/Vendor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The

Contractor/Vendor shall remedy any defect in the work and pay for any damage to other work resulting there from, which shall appear within a period of one (1) year from the date of final acceptance of the work unless a longer period is specified. The City will give notice of observed defects with reasonable promptness.

All guarantees and warranties shall commence on the date of substantial completion or on acceptance by the owner of re-work items. The Contractor shall furnish a one (1) year unconditional warranty. The

warranty shall include all manufacturers' warranties on equipment and material installed by the Contractor or any subcontractors. These items shall be transferred to the City and in the City's name. All warranty items shall be secured in an organized 3-ring binder.

City May Stop the Work: If the work is defective, or the Contractor/Vendor fails to supply sufficient skilled workmen or suitable materials or equipment or if the Contractor/Vendor fails to make prompt payments to Subcontractors for labor, materials, or equipment, the City may order the Contractor/Vendor to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the City to stop the work shall not give rise to any duty on the part of the City to exercise this right for the benefit of the Contractor/Vendor or any other party.

For each consecutive calendar day that the work remains incomplete after the date established for final completion, the Contractor/Vendor shall pay City and the City is authorized to retain from the compensation otherwise to be paid to the Contractor/Vendor the sum of the phase schedule, **$1000.00.** This amount is the minimum measure of damages the City will sustain by failure of the Contractor to complete all remedial work, correct deficient work, clean up the project and other miscellaneous tasks as required to complete all work specified. This amount is in addition to the liquidated damages prescribed above, and likewise shall not be construed as a penalty.

The Bidder hereby agrees that the City reserves the right to waive any bid and to reject any or all bids, or to accept any bid that in its judgment will be in the best interest of the City. The bidder's signature understands and acknowledges the requirements set forth in this bid package.

_____ _____

Signature/Print Name/Company Date

In witness whereof, the Bidder has hereunto set his signature and affixed his seal this_____day of_____A.D. 2024

_____ (Seal) By: _____

Title: _____

Scope of Work: The City of Zephyrhills is seeking a contractor to construct a force main and water main along south side of the City. The project will install approximately 6,000 LF of 6-inch PVC force main along the west side of Gall Boulevard beginning at C Ave and turning east on Tucker Road and terminating west of the railroad tracks. Approximately 4,600 LF of the force main will be installed using horizontal directional drilling; the remainder will be installed using open-cut methods. The force main will connect to an existing 6-inch force main on Tucker Road and no new residential, commercial, or industrial services will be constructed.

Additionally, the project will install approximately 3,000 LF of 8-inch water main along the west side of Gall Boulevard beginning at Alston Ave and turning east on Tucker Road at the existing 8-ich water main on Tucker Road. Approximately 2,700 LF of the water main will be installed using horizontal directional drilling; the remainder will be installed using open-cut methods. The water main will connect to an existing 8-inch water main on Alston Ave and an 8-inch water main on Tucker Road, the project includes a 12-inch valve continuing South on 301 for a future connection.

The project is sized to accept future additional flows.

All design constraints will comply with the City's standard design requirements and State of Florida building requirements. Please download the package, plans, and specification for complete details.

Estimated Cost: **$1.7 million**

Hours of Operation: 7:00 AM – 6:00 PM, Monday – Friday

Completion Time: Total estimated project time is about 15 months from Notice to Proceed. Estimated 3 months for equipment procurement and 12 months for construction.

TelePreConference: **Monday, December 4, 2023 or City Hall 2nd Flr Conf Rm**
Link: **https://meet.goto.com/159259221**
Phone: **1-224-501-3412**
Access Code: **159-259-221**

This Teleconference will be hosted live at City Hall and via GoTo. Should you attend the meeting in person there will be a visit of the areas.

TIME TABLE

Bid Time Table	Date	Day	Time
Bid Distribution	11-20-23	Sunday	
Teleconference Pre-Bid*	12-04-23	Monday	10:00 AM
Equivalent/Question Deadline	12-29-23	Friday	10:00 AM
Response Deadline	01-12-24	Friday	10:00 AM
Presented to City Council	02-12-24	Monday	6:00 PM

*City Hall and/or Teleconference: You may need to type the link in manually in order for it to connect.

GoTo Link: https://meet.goto.com/159259221
Phone: +1 (224) 501-3412
Access Code: 159-259-221

Site visit of the area will follow the meeting.

This Teleconference will be hosted live at City Hall and via GoTo. Should you attend the meeting in person there will be a visit of the areas.

You may need to type the link into explorer rather than copy/paste.

THE AMERICAN INSTITUTE OF ARCHITECTS

Executed in Counterpart(s)

AIA Document A310

Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we (Here insert full name and address or legal title of Contractor/Vendor)

as Principal, hereinafter called the Principal, and (Here insert full name and address or legal title of Surety)

a corporation duly organized under the laws of the State of
as Surety, hereinafter called the Surety, are held and firmly bound unto
(Here insert full name and address or legal title of Owner)

Bonds and All Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

as Obligee, hereinafter called the Obligee, in the sum of ----------
----------**Dollars ($),**

for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, The Principal has submitted a bid for
(Here insert full name, address and description of project)

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and Sealed this _____ of _____ 2024

_____ ***(Seal)***
(Principal and Title)

_____ ***(Surety Seal)***
(Witness)

_____
(Attorney-in-Fact & Licensed Resident Agent)

SWORN STATEMENT PURSUANT TO SECTION 287.133(3)(a),

FLORIDA STATUTES ON PUBLIC ENTITY CRIMES- ITB-2023-03

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.

A. This sworn statement is submitted to _____
(print name of the public entity)

by _____
(print individual's name and title)

for _____
(print name of entity submitting sworn statement)

whose business address is

_____

_____

and (if applicable) its Federal Employer Identification Number (FEIN) is _____
(If the entity has no FEIN, include the Social ro Number of the individual signing this sworn statement: _____.)

B. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

C. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

D. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes means:

a. A predecessor or successor of a person convicted of a public entity crime; or
b. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

E. I understand that a "person" as defined in Paragraph 287.133(1)(e), Florida Statutes means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or

applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

F. Based on information and belief, the statement which I have marked below is true in relation to the
entity submitting this sworn statement. (Indicate which statement applies.)

_____Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (attach a copy of the final order)

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

_____
(Signature)

Sworn to and subscribed before me this _____ day of
_____, 2024.Personally or known_____
Or Produced identification_____Notary Public – State of _____

_____
My commission expires_____(Type of Identification) _____
(Printed, Typed or stamped commissioned name of notary public)

E-VERIFY CERTIFICATION FORM- ITB 2023-03

All vendors, contractors and subcontractors doing business with the City of Zephyrhills must certify that they have implemented the federal E-Verify program.

E-Verify is a federal system established by the Department of Homeland Security to determine the immigration and work-eligibility status of prospective employees. Detailed E-Verify program information for employers can be found at http://www.dhs.gov/e-verify.

Prior to providing goods or services to the City of Zephyrhills, vendors must certify compliance with the federal E-Verify program. In the case of contractors, this includes obtaining written certification from all subcontractors who will participate in the performance of the contract. The certification below has been prepared for all vendors and contractors to use for this purpose. All subcontractor certifications must be kept on file with the contract vendor and made available to the state and/or City upon request.

CERTIFICATION

(In accordance with Executive Order No. 11-02)

I certify that the company shown below is in compliance with the above statement and that I am authorized to sign on its behalf.

Name of Company: _____

Authorized Signature: _____

Printed Name/Title: _____

Address: _____

Date: _____

Phone: _____

Email: _____

The City of Zephyrhills reserves the right to determine how it will respond to any instances of non-compliance or false certification of compliance. Potential City actions include, but are not limited to, cancellation of the contract and/or suspending or debarring the contract vendor from performing services in any aspect to the City.

Please send the completed form with your submittal.

Addenda Receipt Acknowledgment- ITB 2023-03

Addendum #_____ Date _____ Initials_____

Addendum #_____ Date _____ Initials_____

Addendum #_____ Date _____ Initials_____

Addendum #_____ Date _____ Initials_____

Firm Representative:

_____

Signature/Date **(Executed by Corporate Authority)**

DRUG-FREE WORKPLACE FORM- ITB 2023-03

The undersigned vendor, in accordance with Florida Statute 287.087, hereby

certifies that _____ does:
(Name of Business)

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business' policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or pleas of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm fully complies with the above requirements.

_____
Bidder's Signature

_____
Date

PUR062.036
re. 10/97

NON-COLLUSIVE AFFIDAVIT- ITB 2023-03

State of Florida
County of _____

_____ being first duly sworn, deposes and says that he/she is

_____, the party making the fore-going submittal of qualifications or bid that such submittal
(partner or officer of the Firm, etc)

Or bid is genuine and not collusive or sham; that said Firm has not colluded, conspired, connived or agreed, directly or indirectly, with any Firm or person, to put in a sham response or to refrain from responding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person, to secure any advantage against the City of Zephyrhills of any person interested in the proposed contract; and that all statements in said response are true.

_____
Officer

_____ *(Company Name)*

State of Florida
County of _____

The foregoing instrument was acknowledged before me this _____ day of _____ by
_____ *(name and title of corporate officer)*
of _____ *(Name of Corporation),*
a _____ *(state or place of incorporation)* corporation, on behalf of the corporation. He/she is personally known to me or has produced _____ *(Identification type)* as identification.

_____ *(Signature line for notary public)*

_____ *(Name of notary type, printed or stamped)*

_____ *(Title or rank)*

My commission expires: _____
Serial number, if any _____

Errors or Omissions- ITB 2023-03

Upon review of this project's plans and construction documents are you aware of any apparent errors or omissions?

☐ YES

☐ No

If YES, please provide a detailed explanation of any apparent errors or omissions on this sheet.

_____

Company Representative Date

REFERENCES –PROJECTS OF SIMILAR SCOPE- ITB 2023-03

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 2: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 3: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 4: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

REFERENCES –FOR CURRENTLY ACTIVE PROJECTS- ITB 2023-03

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 2: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 3: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 4: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion Form- ITB 2023-03

1. The prospective Vendor, _____, certifies, by submission of this document, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any Federal Department or Agency.

2. Where the Vendor is unable to certify to the above statement, the prospective Vendor shall attach an explanation to this form.

Vendor: _____
Name of Company – Please Print

Signature: _____
Authorized Company Representative

Name/Title: _____

Address: _____

_____

Date: _____

CITY OF ZEPHYRHILLS

STATEMENT OF NO BID

If you do not intend to bid, please complete the information below and return this form with the bid title and number clearly marked on the front of the envelope. Please send the STATEMENT OF NO BID FORM no later than the opening date indicated on the INVITATION TO BID FORM.

Please be advised that if the NO BID STATEMENT is not executed and returned your name may be deleted from the list of qualified bidders for the City of Zephyrhills.

We decline to submit a bid for the following reasons:

- ❑ Unable to meet Bond or Insurance requirements.
- ❑ Unable to meet specifications; we do not offer this product or an equivalent.
- ❑ Specifications are unclear, specialty items or too intricate.
- ❑ Insufficient time to respond; our schedule will not permit us to perform.
- ❑ Reason for declining on attached sheet.

Company Name: _____ Date: _____

Telephone Number: _____ Signature: _____

Return completed form to: **City of Zephyrhills, Purchasing Office**
5335 8th Street
Zephyrhills, FL 33542

CERTIFICATION OF CONTRACTOR REGARDING TRENCH SAFETY- ITB 2023-03

This certification is required pursuant to the Trench Safety Act, Chapter 90-98, Florida Statutes regarding Trench Safety. The Act specifically incorporates the Occupational Safety and Health Administration's excavation safety standards, 29 CFR S. 1928.650 Subpart P as the State standard. Any revision to OSHA's safety standards that are consistent with the Florida Statues shall also be complied with upon its effective date. The act requires that any bidder or prospective contractor, or any of their proposed subcontractors, shall provide written assurance that the contractor will comply with the applicable trench safety standards.

Name of Contractor: _____

Address: _____

_____

Phone: _____

1. Contractor agrees that he is aware of the Trench Safety Act and the requirements of the Act.
2. Contractors agrees to comply with all applicable trench safety standards as set forth in the Act and as referenced in the Act.

Name of Signer: _____
PLEASE PRINT

Title: _____

Signature: _____

Date: _____

AIA Document G701™ – 2017

Change Order

PROJECT: *(name and address)*	CONTRACT INFORMATION: Contract For: Date:	CHANGE ORDER INFORMATION: Change Order Number: Date:
OWNER: *(name and address)*	ARCHITECT: *(name and address)*	CONTRACTOR: *(name and address)*

THE CONTRACT IS CHANGED AS FOLLOWS:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)

The original (Contract Sum) (Guaranteed Maximum Price) was	$ _____
The net change by previously authorized Change Orders	$ _____
The (Contract Sum) (Guaranteed Maximum Price) prior to this Change Order was	$ _____
The (Contract Sum) (Guaranteed Maximum Price) will be (increased) (decreased) (unchanged) by this Change Order in the amount of	$ _____
The new (Contract Sum) (Guaranteed Maximum Price), including this Change Order, will be	$ _____
The Contract Time will be (increased) (decreased) (unchanged) by	( ) days.
The new date of Substantial Completion will be	

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

ARCHITECT *(Firm name)*	CONTRACTOR *(Firm name)*	OWNER *(Firm name)*
SIGNATURE	SIGNATURE	SIGNATURE
PRINTED NAME AND TITLE	PRINTED NAME AND TITLE	PRINTED NAME AND TITLE
DATE	DATE	DATE

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SOUTH 301 W WATER AND WASTEWATER PIPELINES

BID DOCUMENTS
AND
TECHNICAL SPECIFICATIONS

Project No. 26110-051-01

Owner:

CITY OF ZEPHYRHILLS
5335 8th Street
Zephyrhills, Florida 33542



Engineer:

JONES EDMUNDS & ASSOCIATES, INC.
3910 S. Washington Avenue, Suite 210
Titusville, Florida 32780

November 2023

CITY OF ZEPHYRHILLS
SOUTH 301 W WATER AND WASTEWATER PIPELINES
TECHNICAL SPECIFICATIONS

Kenneth A Fraser

Digitally signed by Kenneth A Fraser
Date: 2023.11.08 13:13:24 -05'00'

Kenneth Acie Fraser, PE, Florida Professional Engineer No. PE57452
This item has been digitally signed and sealed by Kenneth Acie Fraser, PE, on the date indicated here. Printed copies of this document are not considered signed and sealed. The signature must be verified on any electronic copies. The above-named Professional Engineer shall be responsible for the following Divisions in accordance with Rule 61G15-23.004, FAC:
Divisions 1, 2, 3, 5, 9, 15
Jones Edmunds & Associates, Inc.

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DIVISION 0

BIDDING AND CONTRACTING REQUIREMENTS

CITY OF ZEPHYRHILLS
FRONT-END DOCUMENTATION

CITY OF ZEPHYRHILLS
South 301 W Water and Wastewater Pipelines
CONSTRUCTION ITEMIZED PRICING SHEET

Item No.	Item Description	Qty.	Unit	Unit Price	Amount
BASE BID					
1	Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions	1	LS		
2	Traffic Control	1	LS		
3	Environmental Protection	1	LS		
4	Construction Survey and Layout	1	LS		
5	6-Inch Sanitary Sewer Force Main via Open-Cut	1,530	LF		
6	6-inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	4,300	LF		
7	8-Inch Potable Water Main via Open-Cut	310	LF		
8	8-inch Potable Water Main via HDD	2,400	LF		
9	Combination Air/Vacuum Valves and Vaults	10	EA		
10	Concrete Restoration	55	SY		
11	Limerock Restoration	55	SY		
12	Asphalt Concrete Restoration	50	SY		
13	Testing Allowance	1	AL		
14	Record Drawings Allowance	1	AL		
	TOTAL BID PRICE				

DIVISION 1

GENERAL REQUIREMENTS

SECTION 01000
PROJECT REQUIREMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Work to be done consists of the furnishing of all labor, materials, and equipment and the performance of all Work included in this Contract. The summary of the Work is presented in Section 01100, Summary of Work.

B. Work Included

1. The Contractor shall furnish all labor, superintendence, materials, plant power, light, heat, fuel, water, tools, appliances, equipment, supplies, and means of construction necessary for proper performance and completion of the Work. The Contractor shall obtain and pay for all necessary local building permits. The Contractor shall perform and complete the Work in the manner best calculated to promote rapid construction consistent with safety of life and property and to the satisfaction of the Engineer and in strict accordance with the Contract Documents. The Contractor shall clean up the Work and maintain it during and after construction, until accepted, and shall do all Work and pay all costs incidental thereto. He shall repair or restore all structures and property that may be damaged or disturbed during performance of the Work.
2. The cost of incidental work described in these Project Requirements for which there are no specific Contract Items shall be considered as part of the general cost of doing the Work and shall be included in the prices for the various Contract Items. No additional payment will be made therefor.
3. The Contractor shall provide and maintain such modern plant, tools, and equipment as may be necessary, in the opinion of the Engineer, to perform in a satisfactory and acceptable manner all the Work required by this Contract. Only equipment of established reputation and proven efficiency shall be used. The Contractor shall be solely responsible for the adequacy of his workmanship, materials, and equipment, prior approval of the Engineer notwithstanding.

C. Public Utility Installations and Structures

Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, vaults, manholes, and all other appurtenances and facilities pertaining thereto whether owned or controlled by the Owner, other governmental bodies, or privately owned by individuals, firms, or corporations

used to serve the public with transportation, traffic control, gas, electricity, telephone, sewerage, drainage, water, or other public or private property which may be affected by the Work shall be deemed included hereunder.

1. The Contract Documents contain data relative to existing public utility installations and structures above and below the ground surface. These data are not guaranteed as to their completeness or accuracy and it is the responsibility of the Contractor to make his own investigations to inform himself fully of the character, condition, and extent of all such installations and structures as may be encountered and as may affect the construction operations.
2. The Contractor shall protect all public utility installations and structures from damage during the Work. Access across any buried public utility installation or structure shall be made to avoid any damage to these facilities. All required protective devices and construction shall be provided by the Contractor at his expense. All existing public utilities damaged by the Contractor shall be repaired by the Contractor, at his expense. No separate payment shall be made for such protection or repairs to public utility installations or structures.
3. Public utility installations or structures owned or controlled by the Owner or other governmental body which are shown on the Drawings to be removed, relocated, replaced, or rebuilt by the Contractor shall be considered as a part of the general cost of doing the Work and shall be included in the prices bid for the various Contract Items. No separate payment shall be made therefor.
4. Where public utility installations of structures owned or controlled by the Owner or other governmental body are encountered during the Work and are not indicated on the Drawings or in the Specifications, and when, in the opinion of the Engineer, removal, relocation, replacement, or rebuilding is necessary to complete the Work under this Contract, such Work shall be accomplished by the utility having jurisdiction, or such Work may be ordered, in writing by the Engineer, for the Contractor to accomplish. If such work is accomplished by the utility having jurisdiction it will be carried out expeditiously, and the Contractor shall give full cooperation to permit the utility to complete the removal, relocation, replacement, or rebuilding as required. If such work is accomplished by the Contractor, it will be paid for as extra work as provided in the Agreement.
5. At all times in performance of the Work the Contractor shall employ acceptable methods and exercise reasonable care and skill so as to avoid unnecessary delay, injury, damage, or destruction of public utility installations and structures and shall at all times in the performance of the Work avoid unnecessary interference with or interruption of public utility services and cooperate fully with the owners thereof to that end.

6. The Contractor shall give written notice to the Owner and other governmental utility departments and other owners of public utilities of the location of his proposed construction operations at least 48 hours in advance of breaking ground in any area or on any unit of the Work.
7. The maintenance, repair, removal, relocation, or rebuilding of public utility installations and structures, when accomplished by the Contractor as herein provided, shall be done by methods approved by the owners of such utilities.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 DRAWINGS AND PROJECT MANUAL

A. Drawings: When obtaining data and information from the Drawings, figures shall be used in preference to scaled dimensions and large-scale drawings in preference to small-scale drawings.

B. Supplementary Drawings

1. When, in the opinion of the Engineer, it becomes necessary to explain more fully the Work to be done or to illustrate the Work further or to show any changes which may be required, the Engineer will prepare drawings known as Supplementary Drawings, with specifications pertaining to such Drawings, and the Contractor will be furnished one complete set of reproducible black line prints (24 inches by 36 inches) and one reproducible copy of the specifications.
2. The Supplementary Drawings shall be binding upon the Contractor with the same force as the Contract Drawings. Where such Supplementary Drawings require either less or more than the estimated quantities of Work, credit to the Owner or compensation therefor to the Contractor shall be subject to the terms of the Agreement.

C. Contractor to Check Drawings and Data

1. The Contractor shall verify all dimensions, quantities, and details shown on the Drawings, Supplementary Drawings, Schedules, Specifications, or other data received from the Engineer, and shall notify the Engineer of all errors, omissions, conflicts, and discrepancies found therein. Failure to discover or correct errors, conflicts, or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory work, faulty construction, or improper operation resulting therefrom, nor from rectifying such conditions at his own expense. He will not be allowed to take advantage of any errors or omissions, as full instructions will be furnished by the Engineer should such errors or omissions be discovered.
2. All schedules are given for the convenience of the Engineer and the Contractor and are not guaranteed to be complete. The Contractor shall assume all responsibility or the making of estimates of the size, kind, and quality of materials and equipment included in Work to be done under the Contract.

D. Specifications: The Technical Specifications each consist of three parts: General, Products, and Execution. The General part of a Specification contains General Requirements which govern the Work. The Products and Execution parts modify and supplement the General Requirements by detailed requirements for the Work and shall always govern whenever there appears to be a conflict.

E. Intent

1. All Work called for in the Specifications applicable to this Contract, but not shown on the Drawings in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified in either the Drawings or in the Specifications but involved in carrying out their intent or in the complete and proper execution of the Work is required and shall be performed by the Contractor as though it were specifically delineated or described.
2. The apparent silence of the Specifications as to any detail or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used. The interpretation of these Specifications shall be made upon that basis.

1.05 MATERIALS AND EQUIPMENT

A. Manufacturer

1. All transactions with the manufacturers or subcontractors shall be through the Contractor unless the Contractor shall request and at the Engineer's option that the manufacturer or subcontractor deal directly with the Engineer. Any such transactions shall not in any way release the Contractor from his full responsibility under this Contract.
2. Any two or more pieces of material or equipment of the same kind, type, or classification, and being used for identical types of service, shall be made by the same manufacturer.

B. Delivery

1. The Contractor shall deliver materials in ample quantities to ensure the most speedy and uninterrupted progress of the Work so as to complete the Work within the allotted time.
2. The Contractor shall also coordinate deliveries in order to avoid delay in or impediment of the progress of the work of any related Contractor.

C. Tools and Accessories

1. Unless otherwise stated in the Contract Documents, the Contractor shall furnish with each type, kind, or size of equipment, one complete set of suitably marked high-grade special tools and appliances which may be needed to adjust, operate, maintain, or repair the equipment. Such tools and appliances shall be furnished in approved painted steel cases, properly labeled and equipped with good-grade cylinder locks and duplicate keys.
2. Spare parts shall be furnished as specified herein and as recommended by the manufacturer necessary for the operation of the equipment, not including materials required for routine maintenance.
3. Each piece of equipment shall be provided with a substantial nameplate, securely fastened in place, and clearly inscribed with the manufacturer's name, year of manufacture, serial number, weight, and principal rate data.

D. Service of Manufacturer's Engineer

1. The Contract Prices for equipment shall include the cost of furnishing a competent and experienced engineer or superintendent who shall represent the manufacturer and shall help the Contractor, when required, install, adjust, test, and place in operation the equipment in conformity with the Contract Documents.

2. After the equipment is placed in permanent operation by the Owner, the engineer or superintendent shall make all adjustments and tests required by the Engineer to prove that the equipment is in proper and satisfactory operating condition and shall instruct such personnel as may be designated by the Owner in the proper operation and maintenance of such equipment.

1.06 INSPECTION AND TESTING

A. General

1. For tests specified to be made by the Contractor, the testing personnel shall make the necessary inspections and tests, and the reports thereof shall be in such form as will facilitate checking to determine compliance with the Contract Documents. Five copies of the reports shall be submitted and authoritative certification thereof must be furnished to the Engineer as a prerequisite for the acceptance of any material or equipment.
2. If, in the making of any test of any material or equipment, the Engineer ascertains that the material or equipment does not comply with the Contract Documents, the Contractor will be notified thereof and he will be directed to refrain from delivering said material or equipment, or to remove it promptly from the site or from the Work and replace it with acceptable material without cost to the Owner.
3. Tests of electrical and mechanical equipment and appliances shall be conducted in accordance with the recognized test codes of the ANSI, ASME, or the IEEE, except as may otherwise be stated herein.
4. The Contractor shall be fully responsible for the proper operation of equipment during testing and instruction periods and shall neither have nor make any claim for damage which may occur to equipment before the time when the Owner formally takes over the operation thereof.

B. Costs

1. The Contractor shall provide all inspection and testing of materials furnished under this Contract, unless otherwise expressly specified.
2. The Contractor shall bear the cost of shop and field tests of equipment and of certain other tests specifically called for in the Contract Documents, and such costs shall be deemed to be included in the Contract Price.
3. The Owner may test materials and equipment submitted by the Contractor as the equivalent to those specifically named in the Contract for compliance. The Contractor shall reimburse the Owner for the expenditures incurred in making such tests of materials and equipment which are rejected for non-compliance.

C. Certificate of Manufacture

1. The Contractor shall furnish the Engineer with authoritative evidence in the form of a certificate of manufacture that the materials to be used in the Work have been manufactured and tested in conformity with the Contract Documents.
2. These certificates shall be notarized and shall include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product or on similar products of the manufacturer.

D. Shop Tests

1. Each piece of equipment for which pressure, duty, capacity, rating, efficiency, performance, function, or special requirements are specified shall be tested in the shop of the maker in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents.
2. Five copies of the manufacturer's actual test data and interpreted results thereof, accompanied by a certificate of authenticity sworn to by a responsible official of the manufacturing company and/or independent laboratory, shall be submitted to the Engineer for approval.
3. The Contractor shall bear the cost of shop tests and of furnishing manufacturer's preliminary and shop test data of operating equipment.

E. Start-up Tests

1. As soon as conditions permit, the Contractor shall furnish all labor, materials, and instruments and shall make start-up tests of equipment.
2. If the start-up tests disclose any equipment furnished under this Contract which does not comply with the requirements of the Contract Documents, the Contractor shall, before demonstration tests, make all changes, adjustments, and replacements required. The furnishing contractor shall assist in the start-up tests as applicable.

F. Demonstration Tests

1. Before the Contractor's request for a Substantial Completion inspection, all equipment and piping installed under this Contract shall be subjected to demonstration tests as specified or required to prove compliance with the Contract Documents.
2. The Contractor shall furnish labor, fuel, energy, water, and all other materials, equipment, and instruments necessary for all demonstration tests at no additional cost to the Owner. The Contractor shall assist in the demonstration tests as applicable.

1.07 LINES AND GRADES

A. Grade

1. All work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings or as given by the Engineer. The full responsibility for keeping alignment and grade shall rest upon the Contractor.
2. The Engineer will establish bench marks and provide coordination points. Reference marks for lines and grades as the Work progresses will be located by the Contractor to cause as little inconvenience to the prosecution of the Work as possible. The Contractor shall place excavation and other materials so as to cause no inconvenience in the use of the reference marks provided. He shall remove any obstructions he places contrary to this provision.

B. Surveys

1. At his own expense, the Contractor shall furnish and maintain stakes and other such materials.
2. The Contractor shall check such reference marks by such means as he may deem necessary and, before using them, shall call the Engineer's attention to any inaccuracies.
3. At his own expense, the Contractor shall establish all working or construction lines and grades as required from the reference marks set by the Engineer and shall be solely responsible for the accuracy of these lines and grades. He shall, however, be subject to check and review by the Engineer.

C. Safeguarding Marks

1. The Contractor shall safeguard all points, stakes, grade marks, monuments, and bench marks made or established on the Work, bear the cost of re-establishing them if disturbed, and bear the entire expense of rectifying work improperly installed due to not maintaining or protecting or to removing without authorization such established points, stakes, and marks.
2. The Contractor shall safeguard all existing and known property corners, monuments, and marks adjacent to but not related to the Work and shall bear the cost of re-establishing them if they are disturbed or destroyed.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01100
SUMMARY OF WORK

PART 1 GENERAL

1.01 SCOPE OF WORK

Unless otherwise expressly provided in the Contract Documents, the Work must be performed in accordance with best modern practice, with materials and workmanship of the highest quality to the satisfaction of the Owner.

A. The Project title is:

South 301 W Water and Wastewater Pipelines
City of Zephyrhills, Pasco County, Florida
Jones Edmunds Project No. 26110-051-01

B. The Work of this Project includes:

1. Installing approximately 6,000 linear feet (LF) of 6-inch sanitary sewer force main beginning at C Avenue on Gall Boulevard turning onto Tucker Road and ending west of the railroad tracks. Approximately 4,600 LF of the force main will be installed using horizontal directional drilling (HDD); the remainder will be installed using open-cut methods.
2. Installing approximately 3,000 LF of 12-inch potable water main along Gall Boulevard between Alston Avenue and Tucker Road. Approximately 2,700 LF of the potable water main will be installed using HDD; the remainder will be installed using open-cut methods.
3. Project restoration will include repairing pavement, re-sodding of affected areas, and replacing concrete curb/gutter and sidewalk.

C. The Specification divisions and Drawings are an integrated part of the Contract Documents and, as such, will not stand alone if used independently as individual sections, divisions, or drawing sheets. The Drawings and Specifications establish minimum standards of quality for this project. They do not purport to cover all details entering into the design and construction of materials and equipment.

1.02 REFERENCE STANDARDS

Reference standards and recommended practices referred to herein shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Association of State Highway and Transportation Officials (AASHTO) Formerly (AASHO)
B. American Concrete Institute (ACI)
C. American Institute of Steel Construction (AISC)
D. American Iron and Steel Institute (AISI)
E. American National Standards Institute (ANSI)
F. American Standards Association (ASA)
G. American Society of Mechanical Engineers (ASME)
H. American Society of Testing and Material (ASTM)
I. American Water Works Association (AWWA)
J. American Welding Society (AWS)
K. Anti-Friction Bearing Manufacturer's Association (AFBMA)
L. Building Officials and Code Administrators International, Inc. (BOCA)
M. Construction Specifications Institute (CSI)
N. Federal Specification (FS)
O. Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction, Latest English Edition (Standard Specifications)
P. FDOT Roadway and Traffic Design Standards Latest English Edition (FDOT Index)
Q. Geosynthetics Institute (GSI)
R. National Bureau of Standards (NBS)
S. National Electrical Manufacturer's Association (NEMA)
T. National Fire Protection Association (NFPA)
U. Portland Cement Association (PCA)
V. Occupational Safety and Health Act (Public Law 91-596), U.S. Department of Labor (OSHA)
W. Steel Structures Painting Council (SSPC)
X. Southern Standard Building Code (SSBC)
Y. Underwriters' Laboratories, Inc. (UL)
Z. United States of America Standards Institute (USASI)
AA. Regulations of Florida Industrial Commission Regarding Safety
BB. All local, state, county, or municipal building codes requirements of the Owner's Insurance

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.05 GENERAL REQUIREMENTS

A. Unless otherwise specified on the Construction Drawings or Specifications, all work and the quality of materials shall conform to the referenced sections of the Florida Department of Transportation (FDOT) *Standard Specifications for Road and Bridge Construction, Supplementary Specifications*, and *Roadway and Traffic Design Standards*. The Contractor shall retain on the job site copies of these standard FDOT documents. The basis of payment shall conform to Section 01200, Measurement and Payment, of the General Requirements.

1.06 WORKING HOURS

A. Work under this contract shall not be prosecuted on Saturdays, Sundays or on State and/or National holidays, except in time of emergency, and then only under written permission from the Owner who shall be the sole judge as to the urgency of that situation. On weekdays the workday shall be limited to daylight hours.

B. If the Contractor deems it necessary to work on Sundays, holidays, or beyond daylight hours to comply with his construction schedule or because of an emergency, the Contractor shall request permission of the Owner to do so. If, in the opinion of the Owner, the need is bona fide, the Owner will authorize the Contractor to work such hours as may be necessary.

1.07 REIMBURSEMENT FEES

A. The following rates shall be applied as the Owner's reimbursement of the Engineer's fee to be paid by the Contractor for expenses defined in Supplementary Conditions SC-6.02.C, SC-6.05.A.2.f, SC-6.17.E.2, SC-9.05.B, and SC-13.03.A.

1.	Field Representative (Construction):	$125.00
2.	Construction Administrator:	$155.00
3.	Engineering Consultant (Project Manager):	$200.00
4.	Engineering Consultant (Chief Engineer):	$265.00
5.	CADD/Designer:	$125.00
6.	Administrative Assistant:	$ 80.00

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01200
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers methods of measurement and payment for items of work under this Contract.

B. The total Contract Price shall cover all work required by the Contract Documents. All cost in connection with the proper and successful completion of the work, including furnishing all materials, equipment, and tools and performing all necessary labor and supervision to fully complete the work, shall be included in the unit price and lump-sum Bid prices. All work not specifically set forth as a pay item in the Bid Form or Bid Schedule shall be considered a subsidiary/ ancillary obligation of the Contractor and all costs in connection with these subsidiary/ancillary obligations shall be included in the Bid(s) to provide a complete and functional Project.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 EXCAVATION, TRENCHING, AND CLEARING

A. Except where otherwise specified, the unit price or lump-sum price bid for each item of work which involves excavation, trenching, clearing, grubbing, or disposal of cleared and grubbed materials shall include all costs for such work. No direct payment shall be made for clearing, grubbing, disposal of cleared or grubbed materials, excavation, trenching, disposal of surplus excavated material, handling water (and groundwater) and purchasing and hauling of required fill material. All excavation and trenching shall be unclassified as to materials which may be encountered; in addition, trenches shall be unclassified as to depth, unless otherwise stated.

1.05 LUMP SUM

A. For lump-sum items, payments shall be made to the Contractor in accordance with an accepted Progress Schedule of Values on the basis of actual work completed and accepted by the Owner at the final completion of the Project.

1.06 UNIT PRICE

A. For unit price items, payment shall be made based on the actual amount of work accepted by the Owner and for the actual amount of materials in place at the final completion of the Project, as confirmed by the final measurements.

B. After the work is completed and before final payment is made, the Engineer will make final measurements, with all required assistance from the Contractor, to determine the quantities of various items of work accepted as the basis for the final unit price payment.

1.07 PAYMENT FOR INCREASED OR DECREASED QUANTITIES

A. When alterations in the quantities of unit price work not requiring a Change Order(s), as herein provided for, are ordered and performed, the Contractor shall accept payment in full at the Contract unit price multiplied by the actual quantities of work constructed and accepted by the Owner at the completion of the project.

B. The actual percentage of each lump sum bid item completed by the Contractor and accepted by the Owner at the final completion of the Project will be paid to the Contractor.

1.08 DELETED ITEMS

A. Should any items contained in the Bid Schedule(s) be found unnecessary for the proper completion of the work contracted, the Engineer may eliminate such items from the Contract. This action shall in no way invalidate the Contract and no financial allowance or compensating payment for anticipated profit, overhead, etc., will be made for items so eliminated in making final payment to the Contractor.

1.09 PARTIAL PAYMENTS

A. Partial payments shall be made monthly as the work progresses. Partial payment shall be made subject to the provisions of the General and Supplementary Conditions.

1.10 PAYMENT FOR STORED MATERIAL DELIVERED TO THE PROJECT

A. When requested by the Contractor and at the discretion of the Owner, payment may be made for all or part of the value of acceptable materials and equipment to be incorporated into bid items, which have not been used, and which have been delivered to the construction site or placed in storage places acceptable to the Owner. The Contractor shall provide receipts for all stored material items requested for reimbursement which clearly identify the stored material item, where it is to be constructed, the unit cost of the item, as well as the total cost of the delivered item(s), the quantity of the item, the brand name of the item, and the supplier. Note that there are additional documentation requirements and storage requirements within the Contract Documents that must also be met before the Contractor can be reimbursed for these stored materials.

B. No payment shall be made for fuels, supplies, installation or connection hardware, lumber, false work, or other similar materials or on temporary structures or other work (items) of any kind which are not a permanent part of the Contract. Items having a value of less than $2,500 shall not be compensated for as a stored material item.

1.11 FINAL PAYMENT

A. If requested by the Engineer, the Contractor shall field verify all quantities in dispute by using visual observation, taped measurements, or other methods designated by the Engineer. The field verification shall be made in the presence of the Engineer and agreed to by both the Engineer and the Contractor. The Engineer will prepare a final adjusting Change Order which will adjust the final quantities of the project Bid Schedule to reflect the actual work accepted by the Owner and for which the Contractor will be compensated.

1.12 SCHEDULE OF VALUES

A. A schedule of values for the lump-sum bid items and some of the unit price bid items as required by the Engineer shall be submitted and accepted before the first pay request is approved by the Engineer. The schedule of values shall be based on the prices bid in the Bid Schedule(s). Prices bid in the Bid Schedule(s) cannot be changed in the schedule of values; they can only be broken down into more detail so that the Engineer can more accurately review and approve the Contractor’s pay application for the completed work.

1.13 MISCELLANEOUS CONSTRUCTION ITEMS

A. When pipe/service lines are constructed across a road, the road shall not be cut to perform this construction unless authorized in writing by the Engineer. Service

lines are to be bored, jack and bored, or horizontally directionally drilled (HDD) under the road. Jetting of water lines or water service lines will not be allowed.

B. The Contractor shall take all precautions necessary to protect existing utilities, roads, and miscellaneous items from damage during construction.

C. The Contractor shall repair, relocate, or replace existing utilities, roadways, and miscellaneous items to pre-construction conditions.

D. All repairs, relocations, and replacements necessary are considered incidental to the work and will be at the Contractor's cost, with no cost to the Owner.

E. The unit-price bid items and lump-sum bid items for all pipe items shall constitute full compensation for furnishing, laying, jointing, and testing of pipe; dewatering; excavation and backfill; and cleanup. All pipe lines, including but not limited to water lines, force mains, and gravity sewer lines, which are to be paid for per linear foot in the Bid Schedule, will be measured for payment only on a horizontal plane after installation, unless otherwise noted.

F. Payment for the water services, fire hydrants, and isolation valve bid items shall not be made until the associated Water Service Cards, Fire Hydrant Cards, and Isolation Valve Cards have been properly filled out, signed by the Contractor, and accepted by the Engineer as completed installations. Samples of the Water Service Card, Fire Hydrant Card, and Isolation Valve Card are located at the end of Specification Section 15110, Manual, Check, and Process Valves. The Contractor shall make all required copies of the cards for use in the work.

G. The Contractor shall have the City observe and document the installation of each underground fitting on the project. If the installation of any fitting is not confirmed and documented by the City, it shall not be paid for by the Owner.

PART 2 PAY ITEM DESCRIPTIONS

2.01 BID – SOUTH 301 W WATER AND WASTEWATER PIPELINES

The descriptions provided in the following Paragraphs are to be used by the Bidder in preparing the Bid Schedule(s). They generally indicate how the major workscope items and their respective costs are to be separated into the line items listed in the Bid Schedule(s). These descriptions are not fully representative nor all-inclusive of the work required to complete the project in accordance with the Contract Documents. It is the Bidder's responsibility to include all required costs within the most appropriate line item(s).

BASE BID

Item 1. Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions (not to exceed 5% of the Base Bid)—This item shall include and cover the costs for performing construction; preparatory and overhead operations including but not limited to movement of personnel and equipment to and from the site; sanitary facilities; project administration and management; insurance; Owner and Engineer indemnification; temporary utilities; permits related to construction; performance and payment bonds in accordance with Florida Statutes 225.05; site safety and health program during the execution of the Construction Contract that complies with all local, state, and federal safety guidelines and laws; and all other similar activities and facilities necessary for executing this project. This lump-sum item shall not exceed 5% of the Base Bid amount. The Contractor will be paid 20% of this item upon completion of mobilization and 10% upon demobilization; the remainder will be prorated equally over the construction period.

Item 2. Traffic Control—The Contractor shall furnish all labor, signage, barricades, and other equipment necessary to provide traffic control in accordance with the Florida Department of Transportation (FDOT) Standard Specifications for all phases of work and all other maintenance of traffic plans as may be required by local, county, or state agencies. The Contractor will be paid 40% of this lump-sum item upon delivery and set up of the materials, and the remainder will be prorated equally over the construction duration.

Item 3. Environmental Protection—This item shall include but not be limited to all costs for providing a comprehensive environmental protection program for the project site and other areas as may be affected by the construction. This includes providing labor and materials necessary to prevent environmental damage to the ground, water, and air in conformance with all local, state, and federal laws. Examples include control of stormwater, erodible soils, noise, dust, pollutants, trash, waste, pumping discharge, and any other substance or activity that may adversely impact the environment. The Contractor will be paid 40% upon delivery and set up of the materials, and the remainder will be prorated equally over the construction period.

Item 4. Construction Survey and Layout—This item shall include all costs for providing the services of a Professional Land Surveyor to perform pre-construction stakeout; establish vertical control; and establish horizontal control, right-of-way locations, property boundary locations, and Record Drawing information verification and certification in accordance with the Contract Documents and to the satisfaction of the Owner. The Contractor will be paid 40% of this lump-sum item upon initial project layout, and the remainder will be prorated equally over the duration of construction.

Item 5. 6-Inch Sanitary Sewer Force Main via Open-Cut—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 6-inch sanitary sewer force mains installed by open cut as shown on the Drawings in accordance with the Contract Documents, including but not limited to all polyvinyl chloride (PVC) pipe, ductile iron (DI) pipe, DI fittings and connections, pipe restraints, end plugs, tracing wire, flushing of all

lines, connections, excavation, backfill, compaction, sodding/seeding, pressure testing, all associated appurtenances, and any other incidentals necessary for a complete and operable system as designed. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 6. 6-Inch Sanitary Sewer Force Main via Horizontal Directional Drilling (HDD)—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 6-inch sanitary sewer force main via HDD as shown on the Drawings in accordance with the Contract Documents, including but not limited to bore pits, piping, boring, reaming, back-reaming, slurry, slurry relief holes, installing the pipe in the bore, connections and transition couplings, high-density polyethylene (HDPE) reducers, HDPE fittings, removing or avoiding obstructions in the path of the HDPE pipe, existing utility coordination and relocation, excavation, backfill, compaction, sodding/seeding, site restoration, pressure testing, disinfection, disposal of soil (including disposal of soil/slurry mixture), and all associated appurtenances. Concrete, asphalt, or limerock repairs required specifically for the HDD installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 7. 8-Inch Potable Water Main via Open-Cut—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 8-inch potable water main via open-cut as shown on the Drawings in accordance with the Contract Documents, including but not limited to all PVC pipe, DI fittings and connections, pipe restraints, end plugs, fire hydrants, tracing wire, flushing of all lines, connections, excavation, backfill, compaction, sodding/seeding, landscape restoration, mailbox and other improvements restoration, existing utility coordination and relocation, pressure testing, bacteriological testing, all associated appurtenances, and any other incidentals necessary for a complete and operable system as designed. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe. No deduction in length will be made for the space occupied by valves or fittings. Concrete, asphalt, or limerock repairs required specifically for the open-cut water main installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid on a unit-price basis for each linear foot of water main installed complete as measured in place.

Item 8. 8-Inch Potable Water Main via HDD—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 8-inch potable water main via HDD as shown on the Drawings in accordance with the Contract Documents, including but not limited to bore pits, piping, bore, reaming, back-reaming, slurry, slurry relief holes, installing the pipe in the bore, connections and transition couplings, HDPE reducers, HDPE fittings, removing or avoiding obstructions in the path of the HDPE pipe, existing utility coordination and relocation, excavation, backfill, compaction, sodding/seeding, site restoration, pressure testing, disinfection, disposal of soil (including disposal of soil/slurry mixture), and all

associated appurtenances. Concrete, asphalt, or limerock repairs required specifically for the HDD installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 9. Combination Air/Vacuum Valves and Vaults—The Contractor shall furnish and install all labor, materials, equipment, and services for constructing and placing into operation combination air/vacuum valves and vaults as shown on the Drawings in accordance with the Contract Documents, including but not limited to combination air/vacuum valves, pipe saddles, corporation stops, pipe, fittings, isolation valves, gravel bedding, valve boxes, valve manholes with H-20 traffic covers, ARV enclosure, excavation, backfill, and appurtenances. The Contractor will be paid for each combination air/vacuum valve and vault installed complete as measured in place.

Item 10. Concrete Restoration—The Contractor shall furnish all labor, materials, equipment, and services for constructing the concrete restorations as shown on the Drawings in accordance with the Contract Documents, including but not limited to removing and disposing of existing concrete, surface preparation, earthwork, grading, fill, backfill, leveling (where required), concrete pavement, striping, marking, reflectors, and related appurtenances to the satisfaction of the Owner and the permitting agencies. The trench width will be paid according to the Specifications and detail widths. The Contractor will be paid on a unit-price basis for each square yard of concrete restored and installed complete as measured in place.

Item 11. Limerock Restoration—The Contractor shall furnish all labor, materials, equipment, and services for constructing the limerock restorations as shown on the Drawings in accordance with the Contract Documents, including but not limited to removing and disposing of or reusing existing limerock, surface preparation, earthwork, grading, fill, backfill, leveling (where required), and related appurtenances to the satisfaction of the Owner and the permitting agencies. The trench width will be paid according to the Specifications and detail widths. The Contractor will be paid on a unit-price basis for each square yard of limerock restored and installed complete as measured in place.

Item 12. Asphalt Concrete Restoration—The Contractor shall furnish all labor, materials, equipment, and services for constructing the asphalt restorations as shown on the Drawings in accordance with the Contract Documents, including but not limited to removing and disposing of existing asphalt, surface preparation, earthwork, grading, fill, backfill, prime and tack coats, leveling (where required), asphalt pavement, striping, marking, reflectors, and related appurtenances to the satisfaction of the Owner and the permitting agencies. The trench width will be paid according to the Specifications and detail widths. The Contractor will be paid on a unit-price basis for each square yard of asphalt concrete restored and installed complete as measured in place.

Item 13. Testing Allowance—The Contractor shall furnish all labor, materials, equipment, and services necessary for geotechnical in-place density testing of soils and pavement, concrete cylinder testing, and other testing as required by the Engineer and as specified in the Contract Documents. The Contractor will be reimbursed by the Owner for passing tests. Failed tests will not receive additional compensation.

Item 14. Record Drawings Allowance—The Contractor shall furnish all labor, materials, equipment, and services for composing and providing Record Drawings for the entire project in accordance with the Contract Documents, including but not limited to updating the electronic copy of the Drawings, identifying items that were revised during the project or addenda, having all Drawings signed and sealed by a Florida-certified Professional Land Surveyor, and providing signed-and-sealed paper copies of the Record Drawings. Once the Record Drawings have been determined by the Engineer to be complete according to the Specification requirements, the entire lump sum will be paid to the Contractor.

END OF SECTION

SECTION 01290
SCHEDULE OF VALUES

PART 1 GENERAL

1.01 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. To the Engineer, a proposed Schedule of Values allocated to the various portions of the Work, in accordance with Section 01000, Project Requirements, and Section 01200, Measurement and Payment.

B. Upon request of the Engineer, supporting data which will substantiate the values' correctness.

C. The accepted Schedule of Values shall be used only as the basis for the Contractor's Applications for Payment.

D. An update and resubmittal of the Schedule of Values when Change Orders affect the listing or when the actual performance of the Work involves necessary changes of substance to values previously listed and approved.

E. Schedule of Values

1. Submit typed schedule on EJCDC 1910-8-E forms provided by the Engineer. The Contractor's standard form or electronic media printout will be considered.
2. Submit Schedule of Values in duplicate within 10 days after the date of Owner-Contractor Agreement.
3. Format – Use the schedule of prices in the Bid Proposal. Show the cost breakdown for each lump-sum item. The lump-sum breakdown shall, at a minimum, use the Table of Contents of this manual outline. Identify each line item with the number and title of the major Specification Section. Identify site mobilization and demobilization, bonds and insurance, Record Drawings, photographs, and operations and maintenance manuals, etc.
4. For unit cost allowances, identify quantities taken from the Contract Documents multiplied by the unit cost to achieve the total for the item.
5. Include within each line item a direct proportional amount of the Contractor's overhead and profit.

6. Revise the schedule to list approved Change Orders with each Application for Payment.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 CASH ALLOWANCES

A. Costs Included in Allowances—The cost of the product to the Contractor or subcontractor, less applicable trade discounts and applicable taxes.

B. Costs Not Included in the Allowance, But Included in the Contract Price—Product handling at the site, including unloading, uncrating, and storage; protection of products from elements and from damage and labor for installation and finishing.

C. Contractor Responsibilities

1. Execute purchase agreement with designated supplier.
2. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
3. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

D. Differences between allowance amounts and actual costs will be adjusted by Change Order before final payment.

E. Cash Allowances Schedule

1. Testing.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01310
CONSTRUCTION COORDINATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall coordinate Work with that of other construction projects as needed.

B. Before starting Work and from time to time as the Work progresses, the Contractor and each subcontractor shall examine the work and materials installed by others as it applies to its own work and shall notify the Engineer immediately in writing if any conditions exist which will prevent satisfactory results in the installation of the system. Should the Contractor or subcontractor start work without such notification, it shall be construed as an acceptance of all claims or questions as to the suitability of the work of others to receive its Work. The Contractor shall remove and/or replace, at its own expense, all work under this Contract which may have to be removed on account of such defects or omissions.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. The Contractor shall ensure that all drawing, product data, and samples comply with Contract Documents and field dimensions and clearances.

B. The Contractor shall submit requests for interpretation of Contract Documents in a timely fashion to ensure there are no disruptions with the Work as scheduled. Obtain instructions through the Engineer to resolve all queries.

C. Process requests for substitutions and Change Orders through the Engineer.

D. Deliver close-out submittals to the Engineer.

1.03 WORK SEQUENCE

A. The Contractor shall submit a preliminary Progress Schedule, in accordance with Section 01320, Progress Schedule, to the Engineer. After review, the Contractor shall revise and resubmit the Progress Schedule to comply with requested revisions.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 CONSTRUCTION MOBILIZATION

The Contractor shall do the following:

A. Cooperate with the Owner in allocating mobilization areas on site for field offices and sheds, access, traffic, and parking facilities. During construction, the Contractor shall coordinate the use of the site and facilities through the Engineer.

B. Comply with the Engineer's procedures for intra-project communications: submittals, reports and records, schedules, coordination drawings, recommendations, and resolution of ambiguities/conflicts.

C. Comply with the Engineer’s instructions for use of temporary utilities and construction facilities.

D. Coordinate field engineering and layout work under instructions of the Engineer.

E. Coordinate scheduling, submittals, and work of the various Sections of Contract Documents to ensure the efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.

F. Coordinate the sequence of Work to accommodate the Owner occupancy as specified in the Contract Documents.

G. In addition to Progress Meetings specified in Section 01320, Progress Schedule, hold pre-construction conferences with personnel and Subcontractors to ensure coordination of Work. The Engineer shall be informed of such meetings and shall be allowed to attend.

H. Coordinate the Work of various sections having interdependent responsibilities for installing equipment, connecting equipment, and placing such equipment in service.

I. Coordinate the use of project space and the sequence of installing civil, mechanical, structural, instrumentation, systems, and electrical work. Follow practicable routings for pipes, ducts, and conduits, with due allowance for available physical space; make runs parallel with lines of building. Use space efficiently to maximize accessibility for other installations, maintenance, and repairs.

J. Coordinate Work at existing facilities to minimize disruption of the Owner's operations.

K. Assemble and coordinate close-out submittals specified in Section 01770, Project Closeout.

1.07 COORDINATION DRAWINGS

A. The Contractor shall provide information required by the Engineer for preparing coordination drawings.

B. The Contractor shall review drawings before submitting them to the Engineer.

1.08 CLOSE-OUT PROCEDURES

The Contractor shall do the following:

A. Notify the Owner when Work is considered ready for Substantial Completion.

B. Comply with the Owner's instructions to correct items of Work listed in executed Certificates of Substantial Completion.

C. Notify the Owner when Work has reached Final Completion.

D. Comply with the Owner's instructions for completing items of Work found incomplete in the Engineer's final inspection.

E. Comply with Section 01770, Project Closeout.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. All vehicles on the property or easement must be operational.

3.02 UTILITIES

A. The Contractor shall coordinate the activities of all utility companies with equipment in the construction area with the Contractor's and Subcontractor's Work.

3.03 CUTTING AND PATCHING

A. No cutting and patching of new Work will be accepted. All Work must be new and continuous in its final form.

END OF SECTION

SECTION 01320
PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. All work of this Contract shall be scheduled and monitored by the Contractor using the Critical Path Method (CPM) and shall use the Precedence Diagram Method (PDM) of scheduling. The Contractor shall prepare all schedules and all monthly updates described in this Section. The Contractor will prepare revisions of the schedule to reflect changes in the Contractor's plan of performance or changes in the Work and submit these revisions to the Engineer for acceptance. The Engineer's acceptance of the scheduling documents is to ensure that all CPM Scheduling documents prepared by the Contractor are in conformance with the Contract Documents and Specifications described herein. This acceptance will not impose on the Engineer or Owner the responsibility for the schedule or for the sequencing, scheduling, or progress of the Work, nor will the acceptance interfere with or relieve the Contractor of full responsibility for the schedule and the means, methods, procedures, and sequence of construction.

B. The Contractor shall use the latest version of Primavera Scheduling software, or an approved equal, for all CPM Scheduling applications.

C. The Engineer or Owner may retain the professional services of a CPM Scheduling Consultant to assist in the review and acceptance of the CPM Scheduling documents prepared by the Contractor. Therefore, any reference to the Engineer or Owner within this Section may also indicate the involvement of the Engineer's or Owner's CPM Scheduling Consultant.

D. The Contractor shall prepare and maintain a detailed progress schedule throughout the construction of the Project. The schedule shall be the Contractor's working schedule and be used to plan, organize, and execute the Work, record and report actual performance and progress, and show how the Contractor plans to complete the Work. The schedule will be in the form of an activity-oriented network diagram (CPM).

E. When the Contractor prepares the CPM Schedule and the schedule is accepted by the Engineer, it shall become part of the Contract Documents and will be used by Contractor and Engineer to monitor the progress of the Project. The CPM Schedule may be revised to show changes in the Contractor's method or manner of performance; delays, or authorized changes in the Work. All changes to the schedule will be made in accordance with Article 1.07 of this Section.

F. The Contractor acknowledges that free float belongs to the Owner.

1.02 PRELIMINARY 90-DAY CPM SCHEDULE

A. The Contractor shall develop a 90-Day CPM Schedule within 10 days after the date indicated in the Notice to Proceed. This schedule shall be a computerized CPM Schedule showing only the early start, early finish of each work activity. The 90-Day Schedule shall contain work activities over the first 90 days, and the estimated durations for each work activity shall be 15 workdays or less. The balance of the job shall be shown in summary log. The 90-Day Schedule shall include but not be limited to site work, hazardous material removal, demolition, key procurement activities (i.e. submissions, approvals, fabrication, and delivery), equipment, mechanical, electrical, and plumbing coordination and any other work that will occur during the first 90 days. This 90-Day Schedule shall become part of the Detailed CPM Schedule.

1.03 DEFINITIONS

The following terms used in this Section shall have the following meanings:

A. *Activity.* A fundamental unit of work in a CPM Schedule establishing the time and resources required for performing or furnishing a part of the Work or a requisite step. Each Activity has defined geographical boundaries, time duration in days, and a detailed estimate of resources required to construct the task. Each activity is assigned a unique description, activity number, activity code, and a dollar value.

B. *Record Schedule.* The Record Schedule will have actual start dates and actual finish dates for all work Activities and Milestones necessary to complete the Work.

C. *Baseline Schedule.* The Engineer-accepted Proposed Baseline Schedule. The Baseline Schedule is the Contractor's plan which has been approved by the Engineer for completion of the Work in compliance with the Milestones listed in the Contract Documents and within the Contract Time. The Baseline Schedule may be revised only by the Engineer's approval of a Contractor-produced adjusted Baseline Schedule. The Baseline Schedule for the Work is the sole basis for (a) the monitoring of the Contractor's progress against Milestones and the Contract Time; (b) calculating Total Float or Contract Float; and (c) the evaluation and reconciliation of extensions in Contract Time, if any. The first Baseline Schedule shall be designated by all parties as the Baseline Schedule, Rev. 0. When Baseline Schedules are adjusted by the Contractor and approved by the Engineer, they shall be designated as Baseline Schedule, Rev. 1, 2, 3, etc. (as appropriate) and shall replace the previously approved Baseline Schedule.

D. *Contract Float.* Workdays between the Contractor's expected date for early completion of the Work, or specified part, and the corresponding Contract Time.

E. *CPM Network.* The structure of the computerized schedule. The CPM Network accounts for the entire Work and defines the construction logic in terms of all of the Activities with their logical dependencies.

F. *Critical Path.* A series of Activities linked by dependencies that determine the shortest possible time to complete the Work.

G. *Early Dates.* The early start dates and early finish dates, i.e., the dates each Activity will start and finish if each is started at the earliest end of the range of dates that the CPM indicates the Activities can be performed.

H. *Excusable Delay.* An unforeseeable delay, beyond the control of the Contractor, experienced due to no fault or negligence by the Contractor, its subcontractors, or suppliers.

I. *Free Float.* The amount of time that any activity can be delayed without adversely affecting the early start of the following activity.

J. *Fragnet.* A predefined or individual segment of a network which represents a specified sequence of the Work. Fragnets shall be submitted which include all Activities, required resources, and costs and shall be submitted to the Engineer for approval of all Change Orders before their incorporation into the Baseline Schedule by the Contractor. A Fragnet shall be submitted before approval of any proposed logic changes. Fragnets are banded Activities representing a revised portion of the Baseline Schedule and shall be logically connected and constrained by previously existing predecessor and successor Activities, as applicable.

K. *Late Dates.* The late start dates and the late finish dates; i.e., the dates each Activity will start and finish if each is started at the latest end of the range of dates that the CPM Network indicates the Activities can be performed and still achieve the Milestones and Contract Time.

L. *Milestone.* A point of progress designated for the purpose of establishing start or finish times for a key aspect of the Work.

M. *Predecessor Activity.* An Activity which precedes another Activity (to which it is logically tied) in the CPM Network.

N. *Preliminary Schedule*. The Contractor's Baseline Schedule for the first 180 days of the Contract.

O. *Proposed Baseline Schedule.* The Proposed Baseline Schedule shall represent the Contractor's plan for completion of the Work in compliance with Milestones listed in the Contract Documents and within the Contract Time. It represents the Contractor's first complete planned schedule submitted for review and approval by the Engineer. The Proposed Baseline Schedule shall take into account all foreseeable activities to be accomplished by any separate contractors, utility owners, or the Owner's operations. The Proposed Baseline Schedule shall anticipate all necessary manpower and resources to accomplish activities within the durations set forth in the Proposed Baseline Schedule. The Proposed Baseline Schedule shall address and indicate all submittals required by the Contract and indicate the times allowed for review, resubmittal, and approval of submittals. Upon approval by the Engineer, the first Proposed Baseline Schedule shall become the Baseline Schedule, Rev. 0.

P. *Resource Loading.* The allocation of work force and equipment necessary for the completion of an Activity as scheduled.

Q. *Six-Week Schedule.* A detailed progress schedule taken from the Working Schedule, which discloses the plan for the next 6 weeks' Work and the actual schedule for the previous 6 weeks' Work.

R. *Successor Activity.* An Activity which follows another Activity (to which it is logically tied) in the CPM Network.

S. *Total Float.* The number of workdays by which a part of the Work in the Baseline Schedule or Revised Baseline Schedule may be delayed from its Early Dates without necessarily extending the Contract Time.

T. *Working Schedule.* When the Proposed Baseline Schedule (or a subsequent adjustment is made by the Contractor to the Baseline Schedule) is accepted by the Engineer and becomes the Baseline Schedule, Rev. 0, 1, 2, 3, etc., it shall be duplicated and become the Working Schedule. The Contractor shall update the Working Schedule monthly with a Data Date designated by the Engineer. The Working Schedule shall be updated monthly to reflect actual progress only and shall be the basis for determining monthly progress payments and the Contractor's performance in relation to the most recently approved Baseline Schedule. The Final Working Schedule shall be the Record Schedule.

1.04 DETAILED CPM SCHEDULE

A. The Detailed Network Diagram shall provide sufficient detail and clarity of form and technique so that the Contractor can plan, schedule, and control his work properly and the Engineer can readily monitor and follow the progress for all

portions of the Work. The Detailed Network Diagram shall comply with the Contract Times of the Agreement and various limits imposed by the Contract Documents, including required sequencing of portions of the Work described in Section 01100, Summary of Work. The degree of detail shall be to the satisfaction of the Engineer, but the following factors shall have a bearing on the required depth of activity detail:

1. The structural breakdown of the Project.
2. Project Phasing and/or Milestones.
3. The type of work to be performed and the labor trades involved.
4. All purchase, manufacture, and delivery activities for all major materials and equipment.
5. Maintenance of Facilities in Operation.
6. Submittal and approval of shop drawings and material samples.
7. Plans for all subcontract work.
8. Crew flows and sizes.
9. Assignment of responsibility for performing all activities.
10. Access and availability to work areas.
11. Identification of interfaces and dependencies with preceding, concurrent, and follow-on subcontractors and contractors.
12. Testing and start-up of systems.
13. Planning for phased takeover by the Owner.

B. Activities shown shall be in workdays and shall have a maximum duration of 5 days, except in the case of non-construction activities such as procurement of materials and delivery of equipment. All durations shall be the result of definitive manpower and resource planning by the Contractor.

C. The Detailed Network Diagram shall be prepared using a computer plotter.

1.05 COMPUTERIZATION OF THE DETAILED CPM SCHEDULE

A. The mathematical analysis of the Detailed Network Diagram shall be made by computer, and a tabulation for each activity shall include the following:

1. Unique event numbers.
2. Activity descriptions.
3. Durations in workdays for each activity.
4. Earliest start date (by calendar date).
5. Earliest finish date (by calendar date).
6. Latest start day (by calendar date).
7. Latest finish day (by calendar date).
8. Slack or total float in workdays.
9. Percentage of activity completed.

B. The following computer outputs shall be prepared as part of the initial schedule submission and each update thereafter:

1. Activity file sort.
2. Eight-week “Look Ahead” detailed bar chart.
3. Summary bar chart.
4. Additional computer sorts to the schedule as required by the Owner.

1.06 COMPLETION REQUIREMENT

A. The 90-Day Schedule shall be completed within 10 calendar days after the date indicated in the Notice to Proceed.

B. The Detailed CPM Schedule shall be prepared within 30 calendar days after the date indicated in the Notice to Proceed.

C. If the Contractor fails to provide the required CPM scheduling documents to the Engineer within the time prescribed and/or revisions of the scheduling documents within the required time, the Contractor shall be in default of the Contract requirements and the Engineer may withhold approval of progress payments until such time as the Contractor submits the required information.

D. Notwithstanding the implementation of the Progress Schedule, it shall be the sole responsibility of the Contractor to complete the Work within the time of completion required by the Contract.

1.07 UPDATINGS

A. The 90-Day CPM Schedule shall be updated monthly until the Engineer accepts the Detailed CPM Schedule.

B. The first update of the Detailed CPM Schedule shall take place 60 calendar days after the Notice to Proceed with subsequent updates performed monthly at the jobsite for the duration of the Contract.

C. The Contractor shall update the Detailed CPM Schedule monthly, using a cutoff/data date agreeable to the Contractor and the Engineer. This cutoff/data date shall be consistent from month to month. The update information shall include but not be limited to the following:

1. Actual start dates.
2. Actual completion dates.

3. Activity percent completion.
4. Remaining duration of activities in progress.

D. The Contractor shall update all the scheduling documents and submit these documents to the Engineer within 5 workdays of the cutoff/data date.

E. The Contractor shall submit seven copies of the CPM schedule and one electronic copy of the CPM schedule on a CD.

F. As part of the normal CPM update, the Contractor shall prepare a written narrative report highlighting the progress during the past update period. The written narrative report shall include but not be limited to the following information:

1. Summary of work accomplished during the past update period.
2. Milestone Comparison Chart.
3. Analysis of Critical Path(s).
4. Analysis of Secondary Critical Path(s). Secondary Critical Path is defined as float within 10 workdays of Critical Path.
5. Analysis of time lost/gained during the update period.
6. Identification of problem areas.
7. Identification of change orders and/or any delay that is impacting/delaying the project schedule.
8. Solutions to current problems.

G. The Contractor is required to attend and participate in a CPM update review meeting with the Engineer. Attendance is mandatory. This meeting will take place 7 workdays after the cutoff/data date, or during progress meetings as decided by the Owner and the Engineer. The purpose of this meeting is to review past progress, current status, problem areas, and future progress. The Contractor's narrative report will be reviewed at this meeting.

H. All schedule update information outlined above will be reviewed and accepted by the Engineer.

1.08 RECOVERY SCHEDULE

A. If the Contractor fails to achieve the planned progress, as indicated in the approved/updated detailed CPM Schedule, and the Contractor's lack of progress delays the Critical path and/or an intermediate milestone by more than 10 workdays (monthly or cumulatively), the Contractor shall submit to the Engineer for review and acceptance a proposed Recovery Schedule indicating how the Contractor will recover the time lost.

B. If the Contractor fails to submit a Recovery Schedule and/or fails to cooperate with the Engineer in the Recovery Schedule process, the Owner can immediately order the Contractor to accelerate completion of the late activities which have been delayed by whatever means necessary without any additional costs to the Owner. The Owner can withhold future progress payments until the Contractor's progress is in compliance with the Contract Schedule or until the Owner has approved by Change Order proposed adjustments to the contract milestones, extension of contract time, or modification of the Contract Schedule.

1.09 CHANGE ORDERS, DELAYS, AND EXTENSIONS OF TIME

A. When proposed Change Orders, approved Change Orders, or any delays are experienced and the Contractor believes the Change Order/Delay is causing delay to an intermediate contract milestone or to the project completion, the Contractor shall submit to the Engineer a Time Impact Analysis, explaining the influence of each Change Order/Delay on the current updated Contract CPM Schedule. The Contractor shall prepare a "Fragnet" (network analysis) of each Change Order/Delay on the current updated Contract CPM Schedule. The analysis will demonstrate the time impact based on the date the change is given to the Contractor, the status of construction at that point in time, and the event time computation of all affected activities. The event times used in the analysis shall be those included in the latest updated copy of the detailed CPM Schedule closest to the time of delay or as accepted by the Engineer.

B. For the Contractor to be entitled to an extension of Contract time to an intermediate contract milestone and/or to the project completion, the Time Impact Analysis must show that the Change Order/Delay impacts the intermediate contractual milestone date and/or the updated CPM Schedule's Critical Path, thereby directly impacting the project completion date. Change Orders/Delays that do not impact intermediate contractual milestones and/or the critical path and impact activities with float will not be considered as a delay to the project and no extension of time will be granted.

C. The Contractor must submit a written analysis within 7 calendar days after a delay occurs or authorized change in work is given to the Contractor. If the Contractor does not submit a written analysis for specific Change Order(s) or Delay(s) within the specified period of time, then it is mutually agreed that the particular Change Order of Delay has no time impact on the Project CPM Schedule and no time extension is required.

D. The Engineer will accept or reject each Time Impact Analysis within 14 calendar days after submittal unless subsequent meetings and negotiations are necessary. Upon the Engineer's acceptance, the Contractor will incorporate fragnets

illustrating the influence of the Change Orders and Delays into the Detailed CPM Schedule during the first update after agreement is reached.

1.10 PROGRESS MEETINGS

A. The Owner will conduct progress meetings at least once per month to discuss the progress of the Work. The Contractor and any subcontractors the Contractor deems necessary shall attend these meetings. At the Owner's discretion, the frequency of the meetings may be increased if the progress of the Work is not satisfactory or if coordination problems should arise.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01325
CONSTRUCTION PHOTOGRAPHS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall have digital pictures, photographs, and DVDs made of the Work from views and at such times as directed by the Engineer. These photographs shall represent a visual history of the Project, from Contract Award through Contract Completion.

B. The Contractor shall take a preconstruction video of the entire site, including the areas of adjacent properties within 100 feet of the limit of Work. Special effort shall be made to show the existing paved roads, shoulders, signs, and other existing features.

C. The Contractor shall also use electronic "snap-shot" photography as necessary to record and facilitate resolution of on-site issues through the transmission of electronic photographs by e-mail from the site to the Engineer's and Owner's offices.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS

2.01 PRODUCTS

A. Photographs and digital pictures shall be in color. Provide one copy of each digital picture on each of three CDs.

B. Provide photographs taken of each of the major items during construction.

C. View and Quantities Required: A minimum of 30 images per month clearly showing project status and key elements of construction.

D. Deliver electronic images supplied on USB storage media to the Engineer with every pay request.

PART 3 EXECUTION

3.01 VIEWS REQUIRED

A. Photographs shall be from locations to illustrate the condition of construction and the state of progress adequately.

B. The Contractor shall provide before and after photographs of each portion of the site. The below-ground facilities shall include all equipment, walls, floor, piping, supports, and entrance. At major locations photographs shall include before, during, and after photographs and all photographs shall be organized by ascending date order to show the Work as it progresses.

3.02 DESCRIPTIVE INFORMATION

A. Each photograph shall have a permanent title block on the back and shall contain the typed information and arrangement as follows:

COMPLETE PROJECT NAME
Contract No.

CONTRACTOR:	(Name of Contractor)
DATE:	(When Photo was Taken)
PHOTO NO.:	(Consecutive Numbers)
PHOTO BY:	(Firm Name of Photographer)
LOCATION:	(Description of Location and View)

B. The Contractor shall provide the Engineer with a written description of each photograph. This description shall be included in the binders and a copy shall be submitted with the CDs. The Field Engineer or inspector shall approve the description.

3.03 VIDEOTAPE REQUIREMENTS

A. Major Locations

1. The Contractor shall provide color digital video of each major facility and structures and facilities adjacent to the construction before construction starts, during construction, and when construction has been completed.

Approximately every 2 weeks, 15 minutes of digital video shall be submitted to the Engineer showing Work completed, Work in progress, Work started, and problems which occurred since the last taping. The Contractor shall maintain the master video CD ROM of each portion of the facility on the Work site. The master video shall be a running chronicle of construction progress. The Contractor shall combine the bi-weekly video onto the master video. The bi-weekly video shall be submitted to the Engineer within 10 working days after recording and the bi-weekly videos may include multiple locations.

2. All videos shall be recorded with character generator operating with date, time, and location on screen. During video recording, the Contractor shall narrate the video, explaining what is being shown, the problem that has occurred, and what is being done. All videos shall be delivered to the Engineer before Final Completion is submitted.

3.04 DIGITAL PHOTO DOCUMENTATION

A. Catalog and manage Electronic “snap-shots” and images of photographs in a secure digital photo management system capable of being linked to the project schedule and document management database. Add captions, descriptions, and key words. Transfer a copy of all “snap-shots” and photos with their related notes, keywords, captions, and activity IDs to the Engineer weekly.

B. All photographs shall be clear, sharp, and free of distortion after enlargement. Each photograph shall have a permanent title block in the lower right-hand corner which shall be 2 1/2 inches high by 6 inches wide and shall contain the information and arrangement as described in Paragraph 3.02.A above.

END OF SECTION

SECTION 01330
SUBMITTALS AND ACCEPTANCE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall submit documentation that describes the Work to be performed under the Contract as required in this Section. This documentation will be for the Engineer and Owner's review and use. The documentation furnished by the Contractor must enable the Engineer and Owner to verify the Contractor's performance and compliance with Contract requirements. The documentation shall cover all services and deliverables required and secured by the Contract Documents.

1.02 SUBMITTALS

A. General—The Contractor shall submit the following:

1. Project documentation: For the Engineer and Owner's internal use and shall include all information that will be essential for the facility's operations, maintenance, training, and repair of equipment and facilities supplied by the Contractor. The Contractor shall submit all documentation necessary to ascertain compliance with technical/contractual provisions.

2. Shop drawings: Drawings, schedules, diagrams, warranties, and other data prepared specifically for this Contract by the Contractor or through the Contractor by way of subcontractor, manufacturer, supplier, distributor, or other lower-tier contractor to illustrate a portion of the Work.

3. Product data: Preprinted materials such as illustrations, standard schedules, performance charts, instructions, brochures, diagrams, manufacturer's descriptive literature, catalog data, and other data to illustrate a portion of the Work, but not prepared exclusively for this Contract.

4. Samples: Physical examples of products, materials, equipment, assemblies, or workmanship that are physically identical to portions of the Work, illustrating portions of work, or establishing standards for evaluating appearance of finished work or both.

5. Administrative submittals: Data presented for reviews and acceptance to ensure that administrative requirements of the project are adequately met

but not to ensure directly that work is in accordance with the design concept and in compliance with Contract Documents.

6. Mockups: Before installing work requiring mockups, the Contractor shall build mockups for each form of construction and finish required using materials indicated for the completed Work, as follows:

    a. Build mockups in the location and of the size directed by the Engineer.
    b. Notify the Engineer 7 days in advance of dates and times when mockups will be constructed.
    c. Demonstrate the proposed range of aesthetic effects and workmanship.
    d. Obtain the Engineer’s acceptance of mockups before starting work, fabrication, or construction.
    e. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
    f. Demolish and remove mockups when directed by the Engineer.

B. Coordination

1. Submittals and schedules shall be checked and coordinated with the Work of all trades involved before they are submitted and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the Contractor for resubmission.

C. Start of Work

1. Within 30 calendar days after the notice to proceed for the project, the Contractor shall submit to the Engineer a Contract Data Requirements List that defines all data to be submitted under this Contract. Included in this list shall be the names of all proposed manufacturers furnishing specified items to the extent known. Review of this list by the Engineer shall in no way relieve the Contractor from providing materials, equipment, systems, and structures fully in accordance with the Specifications.

D. General Requirements

1. The Contractor shall prepare, assemble, and submit all documents as described herein. The Contractor shall submit certification that the documents prepared conform to the Contract requirements and will result in a complete and operable project. The Engineer and Owner shall review

the Contractor's documents for conformance to the Contract requirements and may comment on the documents.

2. The Contractor shall approve and certify all project documents. The Contractor's failure to certify the documents or failure to provide documents that demonstrate conformance to the Contract requirements are grounds for rejection. The Contractor shall be responsible for and bear all costs for proceeding with any part of the Work that fails to meet the Contract requirements.
3. Submittal of documents for the Engineer's review shall in no way relieve the Contractor of full responsibility for providing a complete, safe, reliable, operating, and coordinated Work (system/equipment/facilities) that is in compliance with these Contract documents.

E. Requests for Substitution

1. All requests for substitution shall clearly and specifically indicate any and all differences or omissions between the products specified as basis of design and the product proposed for substitution. Data shall include but not be limited to differences as follows for both the specified and substituted products:

    a. Principle of operation.
    b. Materials of construction or finishes.
    c. Thickness or gauge of materials.
    d. Weight of item.
    e. Deleted features or items.
    f. Added features or items.
    g. Changes in other work caused by the substitution.
    h. If the substitution contains differences or omissions not specifically called to the attention of the Engineer, the Engineer reserves the right to require equal or similar features to be added to the substituted product at the Contractor's expense.

F. Submittal Requirements and Procedures

1. Drawing Formats and Requirements

    a. Drawings—All Drawings and Shop Drawings shall be prepared on 22-x-34-inch paper and shall have a blank area of 3 x 4 inches in the lower right hand corner above the title block. Each Drawing shall indicate the following information in the title block:

        (1) Title and Drawing Number.
        (2) Date of Drawing or Revision.

(3) Name of Building or Facility.
(4) Name of Contractor or subcontractor.
(5) Drawing contents and locations.
(6) Specification Section and Subsection Numbers.

b. Required Copies—All drawings submitted shall have a minimum of eight copies distributed in the following way:

(1) 2—Owner.
(2) 4—Jones Edmunds.
(3) 2—Returned.

2. Product Data

a. Requirements—Product data shall include all catalog cuts, performance surveys, test reports, equipment lists, material lists, diagrams, pictures, and descriptive material. All product data shall be submitted on either 8.5-x-11-inch or folded 11-x-17-inch size paper of 20-lb (9.072 kg) weight. The submittal information shall show the standard and optional product features, as well as all performance data and specifications. The manufacturer's recommendation for special tools shall be supplied.

3. Samples—The Contractor shall furnish samples required by the Contract Documents, for review by the Engineer. Samples shall be delivered to the Engineer as specified or directed.

a. All samples shall be of sufficient size and quantity to illustrate clearly the functional characteristics of the product, with integrally related parts and attachment devices. The samples shall show the full range of color, texture, and pattern.
b. The Contractor shall submit a minimum of four samples of items submitted. All samples shall be marked with required submittal information, as specified above.

4. Color, Texture, and Pattern Charts

a. The Contractor shall submit color, texture, or pattern charts of all required finishes.
b. A minimum of four charts of each item shall be submitted.

5. Submittal Information Requirements

a. When used in the Contract Documents, the term "Submittal Information" shall be considered to mean the following information at a minimum:

(1) Contract Name.
(2) Contract Number.
(3) Location within Facility.
(4) Date Submitted.

b. Drawings—The Contractor shall mark submittal information on all Drawings in the left half of the 4-x-3-inch block as described above.

c. Product Data and Manufacturer's Literature—The Contractor shall mark all product data and manufacturer's literature with submittal information and note which item is being furnished. The Contractor shall mark the option and supplies to be furnished with the item. At least one original manufacturer product data sheet must be submitted; the balance can be copied. Do not submit the manufacturer's general catalog: submit only items being installed or delivered. When manuals are being submitted, the Contractor shall mark submittal information on both the cover and title page. If manuals being submitted contain more than just one item, each item must be marked and only Contract name and number is to be marked on the cover and title page.

6. Training, Operation and Maintenance Manuals

a. The Contractor shall submit to the Engineer for review and acceptance of manufacturer's installation, operations, lubrication, maintenance, and training manuals for all equipment installed or delivered under this Contract. All manuals shall have submittal information marked on the front cover, title page, and three places inside the manual. If the manual being submitted is for different components, mark the front cover and title page only. Each component section must be marked with the Specification Section and subsection numbers. Operations and Maintenance Manuals shall conform to requirements defined in Section 01830, Operations and Maintenance Manuals.

G. Required Submittals

1. Structural Submittals

a. This Section specifies general procedural requirements for contractual submittals for the following structural schedules, product data, samples, and manufacturer's certificates.

(1) Product Data—The Contractor shall provide product data for all structural items, options, and other data and provide supplemental manufacturer's standard data for information unique to the Work and installation. The submittals shall reflect all items delivered or installed under this Contract.
(2) Samples—The Contractor shall provide all samples required under this Specification including color charts and product samples.
(3) Material, equipment, and installation and demolition Specifications.

2. Mechanical and Electrical System Submittals

a. This Section specifies general procedural requirements for mechanical schedules, performance data, control diagrams, and other submittal data.

b. The Contractor shall submit the following:

(1) Performance Data.

(2) Power and Riser Diagrams—Single line riser, power diagrams, and all conduit runs shall be provided for all equipment and facilities.

(3) Wiring Diagrams—Elementary controls diagrams and separate wiring diagrams for mechanical and electrical unit/subsystem. Drawing for starting and shutdown of equipment including controls shall be provided, including a comprehensive description of operation.

(4) Finished Data—Complete surface preparation and finished data for all mechanical and electrical unit/subsystems shall be provided, including a complete list of cleaning instructions.

(5) Factory Testing—Detailed description of factory testing procedures, reporting procedures and criteria for test passing or failing shall be provided for all mechanical and electrical units/subsystems. Testing shall comply with the General Requirements and Technical Requirements Sections.

(6) Site (Field) Testing and Acceptance—Detailed description of site testing and acceptance tests including descriptions of procedures, testing equipment, reporting procedures, and criteria for passing or failing tests shall be provided for all mechanical and electrical units/subsystems. Testing shall comply with General Requirements and Technical Requirements.

(7) Factory Test Report—After fabrication and testing, the Contractor shall submit the results of tests. No shipment of any mechanical and electrical unit/subsystem shall be allowed without the written certification from the Contractor that the equipment conforms to the Contract requirements.

(8) Site Test and Acceptance Report—Site test and acceptance reports shall be submitted to the Owner and Engineer.

(9) Operations and Maintenance Manuals—The Contractor shall furnish manuals for all mechanical and electrical equipment specified under this Contract. Each manual shall include the following at a minimum:

(a) Description of equipment.
(b) Record shop drawing.
(c) Operation and maintenance instructions.
(d) Part lists.
(e) Equipment ratings.
(f) Valve list.
(g) Lubrication instructions.

c. Compliance with this Section does not relieve the Contractor from compliance with the requirements of Section 01830, Operations and Maintenance Manuals.

H. Submittal Review

1. The Engineer's review of the Contractor's documents shall not relieve the Contractor of the responsibility for meeting all of the requirements of the Contract nor of the responsibility for correcting the documents furnished. The Contractor shall have no claim for additional cost or extension in time because of delays due to revisions of the documents that may be necessary for ensuring compliance with the Contract.

2. The Engineer will review a submittal or re-submittal once, after which the cost of review shall be borne by the Contractor. The cost of Engineering shall be equal to the Engineer's full cost.

3. No partial submittals will be reviewed. A submittal or re-submittal not complete will be returned to the Contractor for completing and re-submittal.

4. Documents submitted by the Contractor for approval by the Engineer will be returned bearing a project-specific stamp bearing the dated signature of the reviewer and one of four boxes checked:

   a. NO EXCEPTIONS NOTED—This indicates that the submittal appears to be in compliance with the requirements of the performance specifications and that the Work may proceed.
   b. MAKE CORRECTIONS NOTED—This indicates that the reviewer has added a minor correction to the submission and that the Work (modified in accordance with the correction comment) may proceed. The Contractor shall accept the responsibility of the modified document and resulting Work with no additional compensation.
   c. AMEND AND RESUBMIT—This indicates that the submittal will require Contractor modifications based on the reviewer's comments that accompanied the returned submittal. The Contractor will be cautioned that work may not proceed under this review status.
   d. REJECTED—This indicates that the submittal is not in conformance with the requirements of the performance Specifications and cannot be modified to gain compliance. A new submittal will be required in the instance of a "reject" status and the Contractor will be cautioned that work may not proceed under this condition.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SUBMITTAL PROCEDURES

A. Before submitting documents for the Engineer's review, the Contractor shall review the documentation for conformance to the Contract requirements. Submittals shall be complete and comprise a logical division of the Contract Work.

B. All documentation submitted by the Contractor to the Engineer shall be accompanied by a letter of transmittal and shall be submitted in a sequence that allows the Engineer to have all of the information necessary for checking and accepting a particular document at the time of submittal.

C. Each document shall be identified by a document number, Contract number, Contract name, location, Specification Section, subsection numbers, and submittal date. Where a manual/drawing is revised to reflect a change in design or a change for any other reason, each such revision shall be shown by a revision number, date, and subject in a revision block. Indication of official approval by the Contractor's Project Manager shall also be included. To permit rapid location of the revision, additional notation shall be made in the manual opposite the line or area where the change was made and identified by the corresponding revision number.

3.02 DOCUMENTATION CONTROL AND SUBMITTAL SEQUENCING

A. The Contract Data Requirements List shall be updated and resubmitted to the Engineer monthly, throughout the duration of the Contract. This list shall identify the Contractor's submittal number, proposed and actual submittal date, Contract Specification Section Number, Paragraph, Item of the Work, and type of document.

B. The Contractor shall work with the Engineer to provide a regulated flow of submittals that allows the Engineer to review the submittals in the defined time frame without undue delays. Monthly the Contractor shall provide the Engineer a schedule of the approximate quantities and delivery dates for all submittals due for the next 120 days.

3.03 FINAL RECORD DRAWINGS

A. The Contractor shall submit the Final Record Drawing Package to the Engineer for review at Substantial Completion. The Contractor shall be provided with CADD files, AutoCAD in the version specified by the Engineer. Final Record Drawings shall be printed on 22-x-34-inch sheets and on CDs, in AutoCAD. The Contractor may request to use a different version, but it must be approved by the Engineer. Record Drawings shall be in accordance with Section 01785, Record Documents.

3.04 REQUIREMENTS FOR SUBMITTAL

A. Additional documents, drawings, interface data, and other pertinent project submittal data are listed in specific sections of this Contract.

3.05 RECORD PRINTS

A. The Contractor shall submit one set of all record prints before final completion. The record print or project records shall include submittals, catalog cuts, drawings, calculations, test reports, manufacturer's data, maintenance manuals, installation instructions, and operating manuals. All "record prints" shall be delivered to the Engineer in three-ring binders with dividers and shall be placed in order by Specification Section.

END OF SECTION

SECTION 01350
ENVIRONMENTAL PROTECTION PROCEDURES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Work covered by this Section consists of furnishing all labor, materials, and equipment and performing all work required for the prevention of environmental pollution in conformance with applicable laws and regulations during and as the result of construction operations under this Contract. In this Section *environmental pollution* is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare, unfavorably alter ecological balances of importance to human life, affect other species of importance to man, or degrade the utility of the environment for aesthetic and/or recreational purposes.

B. The control of environmental pollution requires considering air, water, and land and involves managing noise and solid waste as well as other pollutants.

C. The Contractor shall schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the Work. The Contractor shall provide erosion-control measures such as diversion channels, sedimentation or filtration systems, berms, staked synthetic bales, seeding, mulching or other special surface treatments that are required to prevent silting and muddying of streams, rivers, impoundments, lakes, etc. All erosion-control measures shall be in place in an area before any construction activity in that area.

D. This Section is intended to ensure that construction is achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings. These are general guidelines. It is the Contractor's responsibility to determine the specific construction techniques to meet these guidelines.

E. All phases of sedimentation and erosion control shall comply with and be subject to the laws of the State of Florida and the Project Environmental Resource Permit.

1.02 SUBMITTALS

A. The Contractor shall prepare a sedimentation and erosion-control drawing meeting the requirements of the law and furnish two copies of the approved Drawing to the Engineer.

1.03 WORK SEQUENCE

A. Before beginning the Work, the Contractor shall meet with the Engineer to establish agreed-upon compliance with these provisions and administration of the environmental pollution control program.

B. The Contractor shall remove temporary environmental control features when approved by the Engineer and incorporate permanent control features into the project at the earliest practicable time.

1.04 REFERENCE STANDARDS

A. Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. Where this Section differs from these documents, the requirements of this Section shall apply.

B. The Contractor shall comply with all applicable Federal, State, and local laws and regulations concerning environmental pollution control and abatement.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EROSION CONTROL

A. The Contractor shall provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion-control measures, such as siltation basins, check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Surface water shall be prevented from flowing into excavated areas. Ditches shall be used around the construction area to carry away water resulting from dewatering excavated areas. At the completion

of the Work, ditches shall be backfilled and the ground surface restored to its original condition.

3.02 PROTECTION OF STREAMS AND SURFACE WATERS

A. Care shall be taken to prevent or reduce to a minimum any damage to any stream or surface water from pollution by debris, sediment, or other material or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing or that contains oils or sediments that will reduce the quality of the water in the stream shall not be directly returned to the stream. Such waters shall be diverted through a settling basin or filter before being directed into streams or surface waters.

B. The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water, or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.

C. All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action plan approved by the Florida Department of Environmental Protection and the US Environmental Protection Agency. The Contractor shall submit two copies of approved contingency plans to the Engineer.

D. Water being flushed from structures or pipelines after disinfection with Cl_2 shall be treated with a dechlorination solution approved by the Engineer before discharge.

3.03 PROTECTION OF LAND RESOURCES

A. After completion of construction, the Contractor shall restore land resources within the project boundaries and outside the limits of permanent work to a condition that will appear to be natural and not detract from the appearance of the project. All construction activities shall be confined to areas shown on the Drawings.

B. Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, the Contractor shall first wrap the trunk with a sufficient thickness of burlap or rags over which

softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.

C. The Contractor shall protect trees that may possibly be defaced, bruised, injured, or otherwise damaged by the construction equipment, dumping, or other operations by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly.

D. Any trees or other landscape features scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to their original condition. The Owner will decide the method of restoration to be used and whether damaged trees shall be treated and healed or removed and disposed of.

1. All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 1inch in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.
2. Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and, in the opinion of the Owner, are beyond saving shall be immediately removed and replaced.

E. The Contractor’s storage and other construction buildings required temporarily in the performance of the work shall be located in cleared portions of the job site or areas to be cleared as shown on the Drawings and approved by the Engineer and shall not be within wetlands or floodplains. Preserving the landscape shall be required in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for the Engineer’s approval.

F. If the Contractor proposes to construct temporary roads or embankments and excavations for plant and/or work areas, the Contractor shall submit the following for approval at least 10 days before the scheduled start of such temporary work:

1. A layout of all temporary roads, excavations, embankments, and drainage to be constructed within the work area.
2. Details of temporary road construction.
3. Drawings and cross-sections of proposed embankments and their foundations, including a description of proposed materials.
4. Landscaping drawings showing the proposed restoration of the area. The proposed removal of any trees and shrubs outside the limits of the existing clearing area must be indicated. Locations of guard posts or barriers required to control vehicular traffic and protect trees and shrubs to be

maintained undamaged must also be indicated. The drawings shall provide for the obliteration of construction scars as such and shall provide for a natural appearing final condition of the area. Modification of the Contractor's approved drawings shall be made only with the written approval of the Engineer. No unauthorized road construction, excavation, or embankment construction including disposal areas will be permitted.

G. The Contractor shall remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling, and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation within the roadway areas. The disturbed areas shall be prepared and seeded as approved by the Engineer or Owner.

H. All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.

3.04 PROTECTION OF AIR QUALITY

A. Burning—Burning will not be permitted at the project site for the disposal of refuse and debris.

B. Dust Control—The Contractor shall maintain all excavations, embankment, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or outside the project boundaries free from dust which could cause the standards for air pollution to be exceeded and which would cause a hazard or nuisance to others.

C. An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of petroleum products is prohibited. The use of chlorides may be permitted with approval from the Engineer.

D. To be approved, sprinkling must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor shall have sufficient competent equipment on the job to accomplish this. Dust control shall be performed as the Work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Owner.

3.05 NOISE CONTROL

A. The Contractor shall make every effort to minimize noises caused by the construction operations. Equipment shall be equipped with silencers or mufflers

designed to operate with the least possible noise in compliance with Federal and State regulations.

3.06 MAINTENANCE OF POLLUTION-CONTROL FACILITIES DURING CONSTRUCTION

A. During the life of this Contract, the Contractor shall maintain all facilities constructed for pollution control as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created.

END OF SECTION

SECTION 01355
SPECIAL PROVISIONS

PART 1 GENERAL

1.01 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

B. Unless specified otherwise in the Contract Documents, all equipment supplied under these Specifications shall be warranted by the Contractor and the equipment manufacturers for 1 year. The warranty period shall begin on the date of Owner acceptance.

C. The equipment shall be warranted to be free from defects in workmanship, design, and materials. If any part of the equipment should fail during the warranty period, it shall be replaced in the machine(s) and the unit(s) restored to service at no expense to the Owner.

D. The manufacturer's warranty period shall run concurrently with the Contractor's warranty or guarantee period. No exception to this provision shall be allowed. The Contractor shall be responsible for obtaining equipment warranties in accordance with Section 01780, Warranties and Bonds, from each of the respective suppliers or manufacturers for all the equipment specified under the Contract Documents.

E. If the manufacturer is unwilling to provide a 1-year warranty beginning at the time of Owner acceptance, the Contractor shall obtain from the manufacturer a 2-year warranty starting at the time of equipment delivery to the job site. This 2-year warranty shall not relieve the Contractor of the 1-year warranty starting at the time of Owner acceptance of the equipment.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 INSTALLATION OF EQUIPMENT

A. The Contractor shall take special care to ensure proper alignment of all equipment with particular reference to the pumps and electric drives. The units shall be carefully aligned on their foundations by qualified millwrights after the units' sole plates have been shimmed to true alignment at the anchor bolts. The anchor bolts shall be set in place and the nuts tightened against the shims. After the Engineer has approved the foundation alignments, the bedplates or wing feet of the equipment shall be securely bolted in place. The Contractor shall further check the alignment of the equipment after it is secured to the foundations and, after all alignments are conformed, shall finally grout the sole plates in place. The Contractor shall be responsible for the exact alignment of equipment with associated piping and under no circumstances will "pipe springing" be allowed.

B. The Contractor shall furnish all wedges, shims, filling pieces, keys, packing, grout, or other materials necessary to properly align, level, and secure apparatus in place. All parts intended to be plumb or level must be proven to be exactly so. The Contractor shall perform all grinding necessary to bring parts to proper bearing after erection.

1.05 SLEEVES AND OPENINGS

A. The Contractor shall provide all openings, channels, chases, etc., in new construction and furnish and install anchor bolts and other items to be embedded in concrete, as required to complete the Work under this Contract. The Contractor shall perform all cutting, coring, and rough and finish patching required in existing construction for the work of all trades.

B. Subcontractors shall furnish all sleeves, inserts, hangers, anchor bolts, etc., required for the execution of their work. Before the work of the Contractor begins, the subcontractors shall be responsible for furnishing the Contractor with the above items and with templates, drawings, or written information covering chases, openings, etc., which they require and to follow up the work of the Contractor as it progresses, making sure that their drawings and written instructions are carried out. If the subcontractors fail to do this, they shall be responsible for the cost of any corrective measures that may be required to provide necessary openings, etc. If the Contractor fails to carry out the directions given him, covering details and locations of openings, etc., he shall be responsible for any cutting and refinishing required to make the necessary corrections. In no case shall beams, lintels, or other structural members be cut without the approval of the Engineer.

1.06 GREASE, OIL, AND FUEL

A. The Contractor shall furnish all grease, oil, and fuel required for testing equipment with the respective equipment. The Owner shall be furnished with a year's supply of required lubricants including grease and oil of the type recommended by the manufacturer with each item of equipment supplied under the Contract Documents.

1.07 TOOLS

A. The Contractor shall furnish any special tools (including grease guns or other lubricating devices) which may be necessary for the adjustment, operation, and maintenance of any equipment with the respective equipment.

B. Tools shall be furnished in heavy steel toolboxes complete with lock and duplicate keys.

1.08 PIPE MARKING

A. Pipe marking is included in Division 9 under Painting and Coating, but it shall be the Contractor's responsibility, as required by the Engineer, to help identify pipe contents, direction of flow, and all else required for proper marking of pipe.

1.09 VALVE IDENTIFICATION

A. The Contractor shall prepare a valve schedule for all valves required for the Work showing a number, the location, type, function, and normal operating position for each valve. The schedule shall be submitted to the Engineer for approval not less than 120 days before start-up. The Contractor shall coordinate valve identification with Section 15110, Manual, Check, and Process Valves.

B. The Contractor shall furnish tags for all valves required for the Work. Valve tags shall be 2-inch diameter, 19-gauge, brass or plastic, with brass hooks suitable for attaching the tag to the valve operator. Tags shall be stamped or etched with the valve number and the information on the valve schedule coded in a system provided by the Owner. The Contractor shall submit two samples of the type of tag proposed and the manufacturer's standard color chart and letter styles to the Engineer for approval.

C. The Contractor shall install valve tags on all valves required for the Work.

1.10 NOISE LIMITATIONS

A. All equipment to be furnished under this Contract, unless specified otherwise in the Technical Specifications, shall be designed to ensure that the sound pressure level does not exceed 85 decibels over a frequency range of 37.8 to 9,600 cycles per second at a distance of 3 feet from any portion of the equipment, under any load condition, when tested using standard equipment and methods. Noise levels shall include the noise from the motor. Mufflers or external baffles shall not be acceptable for reducing noise. Data on noise levels shall be included with the shop drawing submittal.

1.11 SPARE PARTS

A. Where spare parts are specified in the Specification Sections, the Contractor shall furnish all spare parts recommended by the manufacturer or system supplier for 1 year of service. In addition, the Contractor shall furnish all spare parts itemized in each Section.

B. The Contractor shall collect and store all spare parts in an area to be designated by the Engineer and shall furnish the Engineer with an inventory listing all spare parts, the equipment they are associated with, the name and address of the supplier, and the delivered cost of each item. Copies of actual invoices for each item shall be furnished with the inventory to substantiate the delivery cost.

C. Spare parts shall be packed in cartons properly labeled with indelible markings with complete descriptive information, including manufacturer, part number, part name, and equipment for which the part is to be used and shall be properly treated for 1 year of storage.

1.12 HURRICANE PREPAREDNESS PLAN

A. Within 30 calendar days of the date of Notice to Proceed, the Contractor shall submit a Hurricane Preparedness Plan to the Engineer and the Owner for approval. The Plan shall describe in detail the necessary measures that the Contractor will perform, at no additional costs to the Owner, in case of a hurricane warning. The Contractor shall revise the Plan as required by the Engineer and Owner.

1.13 WEATHER PROTECTION

A. In the event of inclement weather, the Contractor shall protect the Work and materials from damage or injury from the weather. If, in the opinion of the Engineer, any portion of the Work or materials has been damaged by reason of failure on the part of the Contractor to protect the Work, such Work and materials

shall be removed and replaced with new materials and Work to the satisfaction of the Engineer.

1.14 PROVISIONS FOR CONTROL OF EROSION

A. The Contractor shall take sufficient precautions during construction to minimize the run-off of polluting substances such as silt, clay, fuels, oils, bitumens, calcium chloride, or other polluting materials harmful to humans, fish, or other life, into the supplies and surface waters of the State. Control measures must be adequate to ensure that turbidity in the receiving water will not be increased more than 10 nephelometric turbidity units (NTU), or as otherwise required by the State or other controlling body, in water used for public water supply or fish unless limits have been established for the particular water. In surface water used for other purposes, the turbidity must not exceed 25 NTU unless otherwise permitted. Special precautions shall be taken in the use of construction equipment to prevent operations that promote erosion.

1.15 PROVISIONS FOR THE CONTROL OF DUST AND LITTER

A. The Contractor shall take sufficient precautions during construction to minimize the amount of dust created. Wetting down the Site may be required or as directed by the Engineer to prevent dust as a result of vehicular traffic. Control of blowing litter caused by any regrading by the Contractor shall be the responsibility of the Contractor.

1.16 ON-SITE STORAGE

A. The Contractor should note that there may be special storage requirements and possible charges for noncompliance of on-site storage requirements for materials and equipment as specified in Section 01600, Materials and Equipment.

1.17 ELECTRICAL POWER AND TESTING EQUIPMENT

A. The Contractor shall furnish electric power and all equipment and tools required for testing equipment. The cost of this electric power, equipment, and tools shall be included in the prices quoted in the Bid Form.

1.18 PROTECTION AGAINST ELECTROLYSIS

A. Where dissimilar metals are used in conjunction with each other, the Contractor shall provide suitable insulation between adjoining surfaces to eliminate direct contact and any resulting electrolysis. The insulating material shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers, or other approved materials.

1.19 DAMAGE DUE TO HIGH WATER

A. The Contractor will be responsible for all damage done to his work by heavy rains or floods and he shall take all reasonable precautions to provide against damages by building such temporary dikes, channels, or shoring to carry off stormwater as the nature of the work may require.

1.20 EMERGENCY PHONE NUMBERS AND ACCIDENT REPORTS

A. Emergency phone numbers (fire, medical, police) shall be posted at the Contractor's phone and the phone's location be made known to all.

B. Accidents shall be reported immediately to the Engineer by messenger or phone.

C. The Contractor shall document all accidents and shall submit to the Engineer a fully detailed written report about the accident after each accident.

1.21 ITEMS SPECIFIED ON DRAWINGS

A. Items of material, equipment, machinery, and the like may be specified on the Drawings and not in the Specifications. The Contractor shall provide such items in accordance with the Specification on the Drawings.

1.22 DISINFECTION

A. The Contractor shall clean, disinfect, and bacteriologically test and clear, in accordance with Chapters 62-550, 62-555, and 62-560 of the Florida Administrative Code (FAC), all water supply facilities affected by this project which shall come into contact with raw water, water being treated, or treated water before placing the facility in operation. This shall apply to new facilities installed as well as to existing facilities that are to be modified.

B. The Contractor shall employ a disinfection method approved by the Engineer and Owner and shall fully satisfy the Owner that adequate disinfection has been achieved before placing a facility on-line.

C. The cost of all disinfection work shall be included in the prices quoted in the Proposal. The Contractor shall pay for all bacteriological clearance tests.

1.23 SALVAGE

A. Any existing equipment or material, including but not limited to valves, pipes, fittings, couplings, etc., which is removed or replaced as a result of construction

under this project may be designated as salvage by the Engineer or Owner and, if so, shall be excavated, if necessary, and shall be cleaned and stored on or adjacent to the Site in a protected place specified by the Engineer or loaded onto trucks provided by the Owner. Any equipment or material not worthy of salvaging, as directed by the Owner, shall be disposed of by the Contractor at a suitable location at the Contractor's expense.

1.24 WORKMANSHIP, MATERIAL, AND EQUIPMENT

A. When a particular product or products are specified or called for, it is intended and shall be understood that the proposal tendered by the Contractor include those products in his bid. Should the Contractor desire to substitute a product or products equal to those specified, the Contractor shall furnish information as described in the Standard General Conditions. The alternate product or products submitted by the Contractor shall meet the requirements of the Specifications and shall, in all respects, be equal to the product or products specified by name in the Specifications.

B. All apparatus, mechanisms, equipment, machinery, and manufactured articles for incorporation into the Work shall be the new and unused standard products of recognized reputable manufacturers.

1.25 SERVICES OF MANUFACTURERS' FIELD SERVICE TECHNICIAN

A. Bid prices of equipment furnished under the Contract Documents shall include the cost of a competent field service technician of the manufacturers of all equipment to supervise the installation, adjustment, and testing of the equipment and to instruct the Owner's operating personnel on operation and maintenance. The approved manufacturer's operation and maintenance data as specified in Section 01830, Operations and Maintenance Manuals, shall be delivered to the Engineer before instructing the Owner's personnel. This supervision may be divided into two or more periods as required by the installation program or as directed by the Engineer.

B. After the equipment has been installed and the equipment is presumably ready for operation, but before it is operated by others, the manufacturers' field service technician shall inspect, operate, test, and adjust the equipment. The inspection shall include at least the following points where applicable:

1. Soundness (without cracked or otherwise damaged parts).
2. Completeness in all details, as specified and required.
3. Correctness of setting, alignment, and relative arrangement of various parts.
4. Adequacy and correctness of packing, sealing, and lubricants.

5. Calibration and adjustment of all related instrumentation and controls.
6. Energize equipment.
7. Deficiency correction.
8. Demonstration of compliance with application performance specification.

C. The operation, testing, and adjustment shall be as required to prove that the equipment has been left in proper condition for satisfactory operation under the conditions specified.

D. Upon completion of this operation, testing, and adjustment, the manufacturers' field service technician shall submit to the Engineer, in triplicate, a complete, signed report of the results of the inspection, operation, adjustments, and tests. The report shall include detailed descriptions of the points inspected, tests and adjustments made, quantitative results obtained if such are specified, and suggestions for precautions to be taken to ensure proper maintenance.

E. Each equipment manufacturer shall provide instruction to the Owner's operating personnel. Training shall not be performed until the requirements of Paragraphs B, C, and D above have been fully satisfied and any specified performance testing completed. Training shall be provided on an 8-hour-per-day basis. Partial days (less than 8 full working hours) shall not be credited toward the specified durations. Training shall not be concurrent with on-going testing, debugging, or installation activities but shall be a separate activity devoted exclusively to the instruction of the Owner's personnel in the operation and maintenance of the manufacturers' equipment. Training shall be performed by qualified representatives of each equipment manufacturer specifically skilled in providing instruction to operation personnel. Training shall provide an overview of operations and maintenance requirements and shall include but not be limited to the following:

1. Description of unit and component parts.
2. Operating capabilities and performance criteria.
3. Operating procedures.
4. Maintenance procedures.
5. Servicing and lubrication schedules.
6. Troubleshooting.
7. Electrical instrumentation and control requirements and interface as a minimum. The operating and maintenance data to be provided in accordance with Section 01830, Operations and Maintenance Manuals, shall be used as a basis for training.

F. A certificate from the manufacturer stating that the installation of the equipment is satisfactory; that the unit has been satisfactorily tested and is ready for operation; and that the operating personnel have been suitably instructed in the operation,

lubrication, and care of the unit shall be submitted before start-up and acceptance by the Owner. The certificate shall indicate date and time the instruction was given and names of the operating personnel in attendance.

G. See the detailed Specifications for additional requirements for furnishing the services of the manufacturers' field service technician.

1.26 OPERATING AND MAINTENANCE DATA

A. Operating and maintenance data covering all equipment furnished shall be delivered directly to the Engineer, for approval, within 60 days before the facility's start-up. No payment shall be made for equipment installed or stored on site until the Engineer has approved the adequacy and completeness of the operating and maintenance data. Data shall be prepared and submitted in full conformance with Section 01830, Operations and Maintenance Manuals. Final approved copies of operating and maintenance data shall have been delivered to the Engineer on the Owner's behalf 2 weeks before scheduling the instruction period with the Owner.

1.27 RESPONSIBILITY OF CONTRACTOR

A. The Contractor shall be responsible for the entire Work determined by the Drawings, Specifications, and Contract from the date of the starting of the Work until it is accepted as evidence of approval of the Completion Certificate by the Owner. The Contractor shall be responsible for removals, renewals, and replacements due to action of the elements and all other causes except as otherwise provided in the Specifications. The Contractor shall keep the Contract under his own control, and it shall be his responsibility to see that the Work is properly supervised and carried on faithfully and efficiently. The Contractor shall supervise the work personally or shall have a competent English-speaking superintendent or representative, who shall be on the site of the project at all working hours and who shall be empowered with full authority by the Contractor to direct the performance of the Work and make arrangement for all necessary materials, equipment, and labor without delay.

B. Renewals or repairs required because of defective materials or workmanship or due to the action of the elements or other natural causes, including fire and flood, before the acceptance as determined by the Completion Certificate, shall be done in accordance with the Contract and Specifications at the expense of the Contractor.

1.28 CONSTRUCTION CONDITIONS AND SUBSURFACE INVESTIGATION

A. The Contractor shall strictly adhere to the specific requirements of the governmental unit(s) or agency(ies) having jurisdiction over the Work. Wherever there is a difference in the requirements of a jurisdictional body and these Specifications, the more stringent shall apply.

B. The Contractor shall be responsible for having determined to his satisfaction, before submitting his bid, the nature and location of the Work, the conformation of the ground, the character and quality of the substrata, the types and quantity of materials to be encountered, the nature of the groundwater conditions, the character of equipment and facilities needed before and during the execution of the Work, the general and local conditions, and all other matters which can in any way affect the Work under this Contract. The prices established for the work to be done will reflect all costs pertaining to the Work. Any claims for extras based on substrata, groundwater table, and other such conditions will not be allowed.

1.29 SUSPENSION OF WORK DUE TO WEATHER

A. During inclement weather, all work which might be damaged or rendered inferior by such weather conditions shall be suspended. The orders and decisions of the Engineer as to suspensions shall be final and binding. The ability to issue such an order shall not be interpreted as a requirement to do so. During suspension of the work from any cause, the Work shall be suitably covered and protected so as to preserve it from injury by the weather or otherwise, and if the Engineer shall so direct, the rubbish and surplus materials shall be removed.

1.30 PERMITS

A. Upon notice of award, the Contractor shall immediately apply for all applicable permits not previously obtained by the Owner to do the Work from the appropriate governmental agency or agencies. No work shall begin until all applicable permits have been obtained and copies delivered to the Engineer. The Contractor shall bear all costs for obtaining all permits.

1.31 PUMPING

A. The Contractor with his own equipment shall do all pumping necessary to prevent flotation of any part of the structures during construction operations.

B. For the duration of the Contract and with his own equipment, the Contractor shall pump out water and wastewater which may seep or leak into the excavations or structures. Galleries and other operating areas shall be kept dry at all times. The

Engineer will determine the extent of pumping required in the tanks, channels, and other non-operating areas.

1.32 OWNER OCCUPANCY AND OPERATION OF COMPLETED FACILITIES

A. It is assumed that portions of the Work will be completed before the entire work is completed. Upon completion of construction in each individual facility, including testing, if the Owner, at its sole discretion, desires to accept the individual facility, the Contractor will be issued a dated certificate of completion and acceptance for each individual facility. The Owner will assume ownership and begin operation of the individual facility on that date and the 1-year guaranty period shall begin on that date. The Owner has the option of not accepting any individual completed facility, but accepting the entire work as a whole when it is completed and tested.

1.33 CLAIMS FOR PROPERTY DAMAGE

A. Upon notification by the Owner or Engineer, the Contractor shall investigate each claim for property damage and shall file, within 10 days of such notification, a statement with the Owner or Engineer setting forth all facts and details relative to the claim.

1.34 DAILY REPORTS

A. The Contractor shall submit daily reports of construction activities, including non-workdays. The report shall include the following:

1. Manpower, number of workers by craft.
2. Equipment on the project.
3. Major deliveries.
4. Activities work with reference to the CPM schedule activity numbers.
5. New problems.
6. Other pertinent information.

B. A similar report shall be submitted for/by each subcontractor.

C. The reports shall be submitted to the Engineer’s Field Office within 2 days of the respective report date. Each report shall be signed by the Contractor’s Superintendent or Project Manager.

1.35 CONNECTIONS TO EXISTING SYSTEMS

A. The Contractor shall perform all work necessary to locate, excavate, and prepare for connections to the terminus of the existing systems all as shown on the

Drawings or where directed by the Engineer. The cost of this work and for the actual connection of the existing mains shall be included in the bid for the Project and shall not result in any additional cost to the Owner.

1.36 COORDINATION OF WORK

A. Because of the nature of this Project, the Contractor should expect other construction to occur in the vicinity of this Project during the Contract. In such instances the Contractor will be required to cooperate fully to eliminate or minimize the creation of conflicts. Adjustments from time to time may be required in the Contractor's work location and/or schedule provided a reasonable notice is given by the Owner or Engineer.

B. The Contractor shall afford other contractors and the Owner reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work and shall properly connect and coordinate the Work with such other work. The Contractor shall coordinate his Work with the Owner and other contractors to store his apparatus, materials, supplies, and equipment in such orderly fashion at the site of the Work so that it will not unduly interfere with the progress of the Work or the work of any other contractors.

C. If the execution or result of any part of the Work depends on any work of the Owner or of any separate contractor, the Contractor shall, before proceeding with the Work, inspect and promptly report to the Owner in writing any apparent discrepancies or defects in such work of the Owner or of any separate contractor that render it unsuitable for the proper execution or result of any part of the Work.

D. Failure of the Contractor to inspect and report any deficiencies shall constitute an acceptance of the Owner's or separate contractor's work as fit and proper to receive the Work, except as to defects which may develop in the Owner's or separate contractor's work after completion of the Work and which the Contractor could not have discovered by his inspection before the Work was completed.

E. If the Contractor damages the work or property of the Owner or of any separate contractor on the Project or other work on the Site, or delays or interferes with the Owner's work on ongoing operations or facilities or adjacent facilities or the separate contractor's work, the Contractor shall be liable for damage caused, and, in the case of another contractor, the Contractor shall attempt to settle the claim with the other contractor before the other contractor institutes litigation or other proceedings against the Contractor.

F. If a separate contractor sues the Owner on account of any damage, delay, or interference caused or alleged to have been caused by the Contractor, the Owner shall notify the Contractor, who shall defend the Owner in such proceedings at the

Contractor's expense. If any judgment or award is entered against the Owner, the Contractor shall satisfy the same and shall reimburse the Owner for all damages, expenses, attorneys' fees, and other costs which the Owner incurs as a result of the judgment or award.

G. If a separate contractor causes damage to the Work or to the property of the Contractor or causes delay or interference with the Contractor's performance of the Work, the Contractor shall present directly to the separate contractor any claims it may have as a result of such damage, delay, or interference (with an information copy to the Owner) and shall attempt to settle its claim against the separate contractor before instituting litigation or other proceedings against the separate contractor.

H. In no event shall the Contractor seek to recover from the Owner or the Engineer, and the Contractor hereby represents to the Owner and the Engineer that he will not seek to recover from them, or either of them, any costs, expenses, (including, but not limited to, attorneys' fees) or losses of profit incurred by the Contractor as a result of any damage to the Work or property of the Contractor or any delay or interference caused or allegedly caused by any separate contractor.

I. The Engineer shall determine and adjust any difference or conflict which may arise between the Contractor and other contractors who may be performing work on behalf of the Owner or between the Contractor and workmen of the Owner in regard to their work. If the work of the Contractor is delayed because of any acts of omissions of any other contractor of the Owner, the Contractor shall on that account have no claim against the Owner other than for an extension of time.

1.37 FINAL GUARANTEE

A. The Contractor shall guarantee all work for 1 year from the date of Substantial Completion of the Work by the Owner.

B. If, within the guarantee period, repairs or changes are required in connection with guaranteed work, which, in the opinion of the Engineer, are rendered necessary as the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, the Contractor shall do the following promptly upon receipt of notice from the Owner and without expense to the Owner:

1. Place in satisfactory condition in every way all such guaranteed work and correct all defects in the guaranteed work.
2. Make good all damage to the building or site, or equipment or piping, or their contents, which, in the opinion of the Engineer, is the result of the

use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract.

3. Make good any work or material or the equipment and contents of the building, structure, or site disturbed in fulfilling any such guarantee.

C. If the Contractor, after notice, fails to proceed to comply with the terms of this guarantee within 10 days, the Owner may have the defects corrected and the Contractor and his surety shall be liable for all expenses incurred provided. However, that in case of an emergency where, in the opinion of the Owner, delay would cause loss or damage, repairs may be started without notice being given to the Contractor and the Contractor shall pay the cost of such repairs.

D. All special guarantees or warranties applicable to specific parts of the Work as may be stipulated in the Contract Specifications or other papers forming a part of this Contract shall be subject to the terms of this Paragraph during the first year of life of each such guarantee. The Contractor shall assemble all special guarantees and manufacturers' warranties, along with a summary list of the special guarantees and warranties, and deliver these to the Engineer before the Work is accepted.

1.38 AUTOMATICALLY CONTROLLED EQUIPMENT

A. Whenever batching or mixing plant equipment is required to be operated automatically under the Contract and a breakdown or malfunction of the automatic controls occurs, the equipment may be operated manually or by other methods for 48 hours after the breakdown or malfunction, provided this method of operation will produce results otherwise meeting the Specifications.

1.39 EQUIPMENT DATA FORMS

A. The Contractor shall obtain, prepare, and submit a complete, detailed listing of equipment and motor data for all electrical items furnished under this Contract. This listing shall be submitted with the preliminary draft of Operations and Maintenance Data Manuals on Equipment Data sheets and the Equipment Manufacturer’s Certificate of Installation, Testing, and Instruction and the Manufacturer’s Certificate of Compliance forms.

1.40 RIGHTS IN AND USE OF MATERIALS FOUND ON THE WORK

A. With the approval of the Engineer, the Contractor may use on the project such stone, gravel, sand, or other material determined suitable by the Engineer as may be found in the excavation and will be paid both for the excavation of such materials at the corresponding Contract unit price and for the pay item for which the excavated material is used. The Contractor shall replace at his own expense,

with other acceptable material, all of that portion of the excavation materials so removed and used which were needed for use in the embankments, backfills, approaches, or otherwise. No charge for the materials used will be made against the Contractor.

1.41 OWNER-FURNISHED MATERIAL

A. The Contractor shall furnish all materials required to complete the Work. No materials will be furnished by the Owner.

1.42 MAINTENANCE AND LUBRICATION SCHEDULES

A. The Contractor's attention is directed to Section 01830, Operations and Maintenance Manuals, for requirements relative to the submission of operating and maintenance data for the mechanical equipment. For all mechanical and electrical equipment furnished, the Contractor shall provide a list including the equipment name, address, and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.

1.43 INSTALLATION LISTS

A. All manufacturers or equipment suppliers who propose to furnish equipment or products under the Contract Documents shall submit an installation list to the Engineer along with the required Shop Drawings.

B. The installation list shall include all installation where identical equipment has been installed and has been in operation for at least 1 year.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01400
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. General

1. This Section defines minimum requirements for the Quality Assurance (QA) Program to be provided by the Contractor. The deliverable documents are defined, along with the method of execution of the QA Program.
2. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with the Contract Document requirements.
3. Specified tests, inspections, and related actions do not limit the Contractor's Quality Control (QC) procedures that facilitate compliance with the Contract Documents.

B. Definitions

1. Quality Assurance services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with Contract requirements.
2. Quality Control services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction comply with requirements.

C. Payment

1. Separate payment will not be made for providing and maintaining an effective Quality Assurance and Quality Control Program, and all costs associated with such a program shall be included in the applicable unit prices, lump-sum prices, or allowances contained in the Contract Price Breakdown.

1.02 WORK SEQUENCE

A. Where reference is made to a particular standard, the revision in effect at the time of Bid opening shall apply except where a specific date is established.

B. For products or workmanship specified by association, trades, or other consensus standards, the Contractor shall comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable code.

C. If specified reference standards conflict with Contract Documents, the Contractor shall request clarification from the Engineer before proceeding.

1.03 QUALITY ASSURANCE

A. The Contractor shall install all materials and equipment in a neat and first-class workman-like manner.

B. The Contractor shall replace all existing paving, stabilized earth, curbs, driveways, sidewalks, fences, signs, and other improvements with the same type of material that was removed during construction or as directed by the Engineer without increase in the Contract Price or Contract Time.

C. The Engineer reserves the right to direct the removal and replacement of any items which, in the Engineer's opinion, do not present an orderly and reasonably neat or workman-like appearance, provided such an orderly installation can be made using customary trade methods. The removal and replacement shall be done when directed in writing by the Engineer at the Contractor's own expense and without additional expense to the Owner.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 TOLERANCES

A. Monitor tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. If manufacturers' tolerances conflict with Contract Documents, request clarification from the Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.07 FIELD SAMPLES

A. The Contractor shall furnish field samples at the site as required by individual Specifications Sections for review.

B. Acceptable samples represent a quality level for the Work.

C. Where field sample is specified in individual Sections to be removed, the Contractor shall clear the area after the field sample had been accepted by the Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor is responsible for quality control and shall establish and maintain an effective QC system in compliance with the Contract Documents. The QC system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the Contract requirements. The system shall cover all Work and shall be keyed to the proposed design and construction sequence. The project QC Officer will be held responsible for the quality of work on the job and is subject to removal by the Engineer for non-compliance with quality requirements specified in the Contract. The project QC Officer in this context shall mean the individual with the responsibility for the overall management of the project quality.

3.02 QUALITY CONTROL PLAN

A. General: Not later than 30 calendar days after receipt of Notice to Proceed, the Contractor shall furnish for review by the Engineer the QC Plan proposed to implement the requirements of the Contract. The Plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. The Engineer will consider an interim plan for the first 30 calendar days of operation.

B. Content of the QC Plan: The QC Plan shall include, at a minimum, the following to cover all construction operations, both on-site and off-site, including work by subcontractors, fabricators, suppliers, and purchasing agents:

1. A description of the quality control organization, including a chart showing lines of authority for all aspects of the Work specified. The staff shall include a Quality Control Officer who shall report to the Project Manager or executive.
2. The name, qualifications (in résumé format), duties, responsibilities, and authorities of each person assigned a QC function.
3. A copy of the letter to the Quality Control Officer signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the Quality Control Officer, including authority to stop work which is not in compliance with the Contract.
4. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, off-site fabricators, suppliers, and purchasing agents.
5. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will verify that identified deficiencies have been corrected.
6. Reporting procedures, including proposed reporting formats.

C. Acceptance of Plan

1. Acceptance of the Contractor's plan is required before the start of Work. Acceptance is conditional and will be predicated on satisfactory performance during the Work. The Engineer reserves the right to require the Contractor to make changes in its QC Plan and operations, including removing personnel as necessary to obtain the quality specified.

D. Notification of Changes

1. After acceptance of the QC Plan, the Contractor shall notify the Engineer in writing of any proposed change. Proposed changes are subject to acceptance by the Engineer.

3.03 SUBMITTALS

A. Submittals shall be made as specified in Section 01330, Submittals and Acceptance. The QC organization shall be responsible for certifying that all submittals are in compliance with the Contract requirements.

3.04 TESTS

A. Testing Services

1. All tests to determine compliance with the Contract Documents shall be performed by an independent commercial testing firm acceptable to the Owner. The testing firm's laboratory shall be staffed with experienced technicians, properly equipped, and fully qualified to perform the tests in accordance with the specified standards.
2. Testing services provided by the Owner are for the sole benefit of the Owner; however, test results shall be available to the Contractor. Testing necessary to satisfy the Contractor's internal Quality Control Procedures shall be the sole responsibility of the Contractor.
3. When necessary, the Contractor shall interrupt its Work for Owner sampling and testing. The Contractor shall have no Claim for increase in Contract Price or Contract Time due to such interruption. The Contractor shall cooperate in these testing activities as needed.
4. Testing, including sampling, will be performed by the testing firm's laboratory personnel in the general manner indicated in the Specifications.

B. Transmittal of Test Reports

1. Written reports of tests and engineering data furnished by the Contractor for the Engineer's review shall be submitted as specified for Shop Drawings.

C. Manufacturer's Field Services (As Applicable)

1. The manufacturer's field services will be specified in the respective Equipment Sections.
2. An experienced, competent, and authorized representative of the manufacturer of each item of equipment for which field services are indicated shall visit the Site of the Work and inspect, check, adjust if necessary, and approve the equipment installation. In each case the manufacturer's representative shall be present when the equipment is placed in operation. The manufacturer's representative shall revisit the Site as often as necessary until any and all trouble is corrected and the equipment installation and operation are satisfactory in the opinion of the Engineer.
3. Each manufacturer's representative shall furnish to the Owner, through the Engineer, a written report certifying that the equipment has been properly installed and lubricated, is in accurate alignment, is free from any undue stress imposed by connecting piping or anchor bolts, has been operated under full load conditions, and has operated satisfactorily.

3.05 COMPLETION INSPECTION

A. Final Completion Punch List: Near the completion of all Work the QC Officer shall inspect the Work and develop a "punch list" of items which do not conform to the approved Drawings and Specifications. Such a list of deficiencies shall be included in the QC documentation and shall include the estimated date by which the deficiencies will be corrected. The QC Officer or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Engineer that the Facility is ready for the Engineer's final inspection.

B. Final Inspection and Acceptance: The Contractor's Quality Control Officer and the Engineer will be in attendance at this inspection. Additional Engineer personnel may also be in attendance. The final acceptance inspection will be formally scheduled by the Engineer when all punch list deficiencies have been corrected. Notice will be given to the Engineer at least 14 days before the final inspection and must include the Contractor's assurance that all punch list items will be complete and acceptable by the date scheduled for the final inspection. Failure of the Contractor to have all Contract Work acceptably complete for this inspection will be cause for noncertification of final payment by the Engineer.

3.06 NOTIFICATION OF NONCOMPLIANCE

A. The Engineer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Engineer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.07 REPAIR AND PROTECTION

A. On completion of testing, inspection, sampling, and similar services, the Contractor shall repair damaged construction and restore substrates and finishes.

B. The Contractor shall protect all construction exposed by or for Quality Control service activities.

C. The repair and protection are the Contractor's responsibilities, regardless of the assignment of responsibility for Quality Control services.

END OF SECTION

SECTION 01450
TESTING AND TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Owner will pay for the costs of all passing laboratory tests required to determine soil density, concrete compressive strength, and bacteriological clearance of water main. The cost of all testing shall be paid for from the Bid Item allowance as stated in the Bid Form. Costs will be determined from direct invoices from the testing laboratory to the Contractor. Failed tests will be back-charged to the Contractor at the time of final payment. All required soil, concrete, and bacteriological water testing shall be coordinated with and scheduled by the Contractor.

1. The Contractor shall cooperate with the laboratory to facilitate the execution of required services.
2. The Owner shall approve the selection of the testing laboratory.
3. Employment of a testing laboratory shall in no way relieve the Contractor of the obligation to perform work in accordance with the requirements of the Contract Documents.

1.02 RELATED WORK

A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders, or approvals of public authorities.

B. Respective Sections: Certification of products.

C. Each Section listed: Laboratory tests required and standards for testing.

D. Testing Laboratory inspection, sampling, and testing are required for but are not limited to the following:

1. Section 02230, Site Preparation.
2. Section 02305, Earthwork for Utilities.
3. Section 02700, Earthwork, Paving, and Markings.
4. Section 03301, Concrete and Reinforcing Steel.
5. Section 15055, Piping Systems—General.
6. Section 15141, Disinfection of Piping and Water Storage Facilities.

1.03 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. Submit to the Engineer for review a list and schedule of all tests to be conducted.

C. Describe test procedures along with duration of tests.

D. After each inspection and test, the Laboratory shall promptly submit two copies of the laboratory report to the Engineer, one copy to the Contractor, and one copy to the Owner.

E. Include the following:

1. Date issued.
2. Project title and number.
3. Name of field testing technician or inspector.
4. Date and time of sampling or inspection.
5. Identification of product and Specifications Section.
6. Location in the Project.
7. Type of inspection or test.
8. Date of test.
9. Results of test.
10. Conformance with Contract Documents.

F. When requested by the Engineer, provide interpretation of test results.

1.04 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM E329—Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
2. ASTM D3740—Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

1.05 QUALITY ASSURANCE

A. The Laboratory is not authorized to do any of the following:

1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of the work.
3. Perform any duties of the Engineer of Record or the Engineer.

B. The Contractor shall be responsible for the following:

1. Cooperating with laboratory personnel, providing access to work and to manufacturer's operations.

2. Securing and delivering to the laboratory adequate quantities of representative samples of materials proposed to be used and which require testing.

3. Providing to the laboratory the preliminary design mix proposed to be used for concrete and other materials mixes which require control by the testing laboratory.

4. Furnishing incidental labor and facilities:

   a. To provide access to work to be tested.
   b. To obtain and handle samples at the project site or at the source of the product to be tested.
   c. To facilitate inspections and tests.
   d. To store and cure test samples.

5. Notifying the Engineer and laboratory sufficiently in advance of operations to allow for the laboratory to assign personnel and schedule tests.

6. Employing and paying for the services of the same or a separate, equally qualified independent testing laboratory to perform additional inspections, sampling, and testing required for the Equipment Supplier or Contractor's (as applicable) convenience.

C. Materials and equipment used in the performance of Work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. Standard requirements for quality and workmanship are indicated in the Contract Documents. The Engineer may require the equipment supplier or Contractor (as applicable) to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured

or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the Contract Documents. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor, and no extra charge to the Owner shall be allowed on account of such testing and certification.

D. If the test and any subsequent retest results indicate that the materials or equipment fail to meet the requirements of the Contract Documents, the equipment supplier or Contractor (as applicable) shall pay for the laboratory costs directly to the testing firm and these will not be reimbursable to the equipment supplier or Contractor (as applicable).

1.06 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.07 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.08 QUALIFICATIONS

A. Comply with requirements of ASTM E329 and ASTM D3740.

B. Laboratory: Licensed to operate in Florida.

C. Laboratory Staff: Maintain a full-time Professional Engineer registered in Florida on staff to review the services performed under this project.

D. Testing Equipment: Calibrated at reasonable intervals with devices of accuracy traceable to either National Bureau of Standards (NBS) or accepted values of natural physical constants.

E. Provide qualified personnel at the site. Cooperate with the Engineer and Contractor in performing services.

F. Perform specified inspection, sampling, and testing of products in accordance with specified standards.

G. Ascertain compliance of materials and mixes with requirements of Contract Documents.

H. Promptly notify the Engineer and Contractor of observed irregularities or non-conformance of Work or Products.

I. Perform additional inspections and tests required by Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01500
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.02 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.03 RESPONSIBILITY

A. This Section specifies the minimum requirements for temporary facilities, utilities, and controls required to provide an adequate and safe work site at every stage during construction of the Project. The Contractor is solely responsible for the requirements set forth in this Section.

1.04 ONSITE TEMPORARY

A. Except as otherwise indicated, the Contractor may, at his option, furnish stand-alone utility plants to provide needed services in lieu of connected services from available public utilities, provided such stand-alone plant facilities comply with all governing regulations. Before availability of temporary utility services, the Contractor will provide trucked-in/trucked-out containerized or unitized services for start-up of construction operations at the site.

1.05 COSTS

A. Except as otherwise indicated, the costs of providing and using temporary utility services are included in the Contract Sum.

1.06 TEMPORARY FACILITIES

A. The types of utility services required for temporary use at the project site include the following (other specific services may be required for specific construction methods of operations):

1. Electrical Power Service.
2. Water Service (potable for certain uses).
3. Sanitary.
4. Storm Sewer or Open Drainage/Run-off Control.
5. Gas (fuel) Service.
6. Telephone Service.

1.07 TEMPORARY ELECTRICITY

A. The Contractor shall make the necessary applications and arrangements and pay all fees and charges for electrical energy for power and light necessary for proper completion of the Work and during its entire progress up to time of final acceptance by the Owner. The Contractor shall provide and pay for all temporary switches, connections, and meters.

1.08 TEMPORARY WATER

A. The Contractor shall make all necessary application and arrangements and pay all fees and charges for water necessary for the proper completion of the Project up to the time of final acceptance. The Contractor shall provide and pay for any temporary piping and connections.

1.09 TEMPORARY SANITARY FACILITIES

A. The Contractor shall provide adequate sanitary facilities for the use of those employed on the Work. Such facilities shall be made available when the first employees arrive on the site of the Work, shall be properly secluded from public observation, and shall be constructed and maintained during the progress of the Work in suitable numbers and at such points and in such manner as may be required or approved.

1.10 CLEANLINESS OF FACILITIES

A. The Contractor shall maintain the sanitary facilities in a satisfactory and sanitary condition at all times and shall enforce their use. He shall rigorously prohibit the committing of nuisances on the site of the Work, on the lands of the Owner, or on adjacent property.

1.11 TERMINATION AND REMOVAL

A. At the time the need for a temporary utility service has ended or has been replaced by use of permanent services, or not later than the time of final completion, the Contractor shall promptly remove the installation unless requested by the Engineer to retain it for a longer period. Any work which may have been delayed or affected by the installation and use of the temporary utility, including repairs to construction and grades and restoration and cleaning of exposed surfaces, shall be completed at this time. The Contractor shall replace any work damaged beyond acceptable restoration.

1.12 NOISE CONTROL

A. The Contractor shall provide adequate protection against objectionable noise levels caused by the operation of construction equipment.

1.13 DUST CONTROL

A. The Contractor shall provide for adequate protection against raising objectionable dust clouds caused by moving construction equipment, high winds, or any other cause.

1.14 WATER CONTROL

A. The Contractor shall provide for satisfactory disposal of surplus water and shall submit a plan to the Engineer for review before initiating and implementing the plan. Prior approval shall be obtained from the proper authorities for the use of public or private lands or facilities for such disposal.

1.15 POLLUTION CONTROL

A. The Contractor shall provide for adequate protection against polluting any public or private lands, lakes, ponds, rivers, streams, creeks, and other such areas by the disposal of surplus material in the form of solids, liquids, gases, or from any other cause.

1.16 ADVERSE IMPACT

A. The Contractor shall evaluate and assess the impact of any adverse effects on the natural environment which may result from construction operations and shall operate to minimize pollution of air, ground, or surface waters vegetation, and afford the neighboring community the maximum protection during and up to completion of the construction project.

1.17 STREAMS, LAKES, AND OTHER BODIES OF WATER

A. The Contractor shall take sufficient precautions to prevent pollution of streams, lakes, and reservoirs with fuels, oils, bitumens, calcium chloride, or other harmful materials. He shall conduct and schedule his operations so as to avoid or otherwise prevent pollution of siltation of streams, lakes, and reservoirs and to avoid interference with the movements of migratory fish.

1.18 CHEMICALS

A. All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, must show approval of either US EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions.

1.19 EROSION CONTROL

A. The Contractor shall not expose by construction operations a larger area of erosive land at any one time than the minimum necessary for efficient construction operations, and the duration of exposure of the uncompleted construction to the elements shall be as short as practicable. Erosion-control features shall be constructed concurrently with other work and at the earliest practicable time.

1.20 STORAGE FACILITIES

A. All products, materials, and equipment shall be stored in accordance with the manufacturer's instructions, with seals and labels intact and legible. Products subject to damage by the elements shall be stored in weathertight enclosures. Temperature and humidity shall be maintained within the ranges required by the manufacturer's instructions. Fabricated products shall be stored above the ground on blocking or skids. Products which are subject to deterioration shall be covered with impervious coatings with adequate ventilation to avoid condensation. Loose granular materials shall be stored in a well-drained area on solid surfaces to prevent mixing with foreign matter. Any products which will come in contact with water shall be stored off the ground to prevent contamination.

1.21 INSPECTION

A. Storage shall be arranged in such a manner to provide easy access for inspection. Periodic inspections shall be made of all stored products to ensure that they are maintained under specified conditions and free from damage or deterioration.

1.22 TEMPORARY PROTECTION

A. After installation, the Contractor shall provide substantial coverings as necessary to installed products to protect them from damage from traffic and subsequent construction operations. Coverings shall be removed when no longer needed.

1.23 ADJACENT TO WORK

A. The Contractor shall protect from damage all property along the line of the Work or in the vicinity of or in any way affected by the Work, the removal or destruction of which is not called for by the Drawings. Wherever such property is damaged due to the activities of the Contractor, it shall be immediately restored to its original condition by the Contractor at no cost to the Owner.

1.24 REMEDY BY OWNER

A. In case of failure on the part of the Contractor to restore such property or make good such damage or injury, the Owner may, after 48 hours' notice to the Contractor, proceed to repair, rebuild, or otherwise restore such property as may be deemed necessary and the cost of such repairs, rebuilding, or restoration will be deducted from any monies due or which may become due to the Contractor under this Contract.

1.25 PROTECTION FROM DAMAGE

A. The Contractor shall be responsible for protecting property in the areas in the vicinity of the Project and for protecting his equipment, supplies, materials, and work against any damage resulting from the elements, such as flooding, rainstorm, wind damage, or other such damage, and shall be responsible for damage resulting from the same. The Contractor shall provide adequate drainage facilities, tie-downs, or other protection throughout the Contract period for the protection of his, the Owner's, and other properties from such damage.

1.26 TRAFFIC REGULATION

A. Signs, marking barricades, and procedures shall conform to the requirements of the Florida Department of Transportation Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System, Index 600 Series, Traffic Control Through Work Zones.

1.27 SIGNAGE

A. The Contractor shall provide and maintain adequate barricades around open excavations.

1.28 REMOVAL OF SIGNAGE

A. On completion of the Work, the Contractor shall remove all debris, excess materials, barricades, and temporary work, leaving walkways and roads clear of obstructions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01600
MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

This Section includes the minimum requirements for the furnished materials and equipment for this project. The more stringent requirements in the Technical Specification sections shall take precedence over these requirements for any conflicts.

A. Materials and equipment furnished by the Contractor shall be new and shall not have been in service at any other installation unless otherwise approved. They shall conform to applicable specifications approved in writing by the Engineer.

B. Manufactured and fabricated products shall be designed, fabricated, and assembled in accordance with the best engineering and shop practices. Like parts of duplicate units shall be manufactured to standard sizes and gauges so as to be interchangeable.

C. Quantities of items that are identical shall be by the same manufacturer, regardless of the Design Package breakdown.

D. Equipment sizes, capacities, and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.

E. Materials and equipment shall not be used for any purpose other than that for which they are designed or specified.

F. Where materials or equipment are specifically shown or specified to be reused in the Work, special care shall be used in removing, handling, storing, and reinstalling to ensure their proper function in the completed Work.

G. Material and Equipment Incorporated Into the Work

1. Shall conform to applicable specifications and standards.

2. Shall comply with size, make, type, and quality specified or as specifically approved in writing by the Engineer.

3. Manufactured and fabricated products:

a. Rotating machinery shall be designed and fabricated to provide satisfactory operation without excessive wear and without excessive maintenance during its operating life. Rotating parts shall be statically and dynamically balanced and shall operate without excessive vibration.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 ACCEPTANCE OF MATERIAL AND EQUIPMENT

A. Only new materials and equipment shall be incorporated in the Work. All materials and equipment furnished by the Contractor shall be subject to the inspection and acceptance of the Engineer. No material shall be delivered to the site that does not meet the Contract Specifications.

B. The Contractor shall submit data and samples sufficiently early to permit consideration and acceptance before materials are necessary for incorporating in the work. Any delay of acceptance resulting from the Contractor's failure to submit samples or data promptly shall not be used as a basis of claim against the Owner.

C. The materials and equipment used in the Work shall correspond to the approved samples or other data.

D. If requested, the Contractor shall be required to submit to the Engineer ample evidence that each and every part of the materials, machinery, and equipment to be furnished is of a reliable make and of a type that has been in successful operation within the continental United States. No equipment will be considered unless the manufacturer has designed and manufactured equipment of a comparable type and size for at least 3 years. The Engineer or Owner will not allow any experimental or untried type of material or machinery to be installed.

E. The equipment specified shall be carefully designed and installed to ensure that it adequately performs all required functions within the specified degree of precision. Each unit shall operate with each of the other parts of the equipment to provide a completely integrated system that shall operate to the satisfaction of the Engineer and Owner.

F. All equipment, machinery, parts, and assemblies of equipment, machinery, or parts entering into the Work shall be tested as specified. Unless waived in writing by the Engineer, all field and operating tests shall be made in the presence of the Engineer or the Engineer's authorized representative. When such a waiver is issued, the Contractor or manufacturer shall furnish sworn statements in duplicate of the tests conducted and the results of the tests to the Engineer.

G. The Contractor shall submit copies of welding procedures for all welding. Welders and welding operators shall be selected in accordance with the qualification requirements of the AWS Code. Welders and welding operators for stainless steel shall pass qualification tests using stainless steel filler metal and procedures developed for stainless steel. Procedures, welder, and operator qualifications shall be certified by an independent testing laboratory retained and paid by the Contractor.

H. The Contractor shall not start fabrication of the Work until the Contractor receives written acceptance of the proof of welding procedures from the Engineer for each type of weld.

I. The Contractor shall submit copies of mill certificate for each type of rolled steel and as required in the Specifications. The Contractor shall not start fabrication of the work until the Contractor receives written acceptance of all mill certificates from the Engineer.

1.05 MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION

A. The equipment installation details shall suit the existing and furnished equipment and are subject to acceptance by the Engineer.

B. Any changes or revisions made necessary by the type and dimensions of the equipment furnished shall be made at the expense of the Contractor who shall furnish detailed drawings showing such changes or revision for the acceptance of the Engineer.

C. The installation of all work shall comply with the manufacturer's printed instructions. The Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including six copies to the Engineer for

distribution. One complete set of instructions shall be maintained at the job site during installation and until the Project is complete.

D. All products and equipment shall be handled, installed, connected, cleaned, conditioned, and adjusted in accordance with the manufacturer's instructions and specified requirements. Should job conditions or specified requirements conflict with the manufacturer's instructions, such conflicts shall be called to the Engineer's attention for resolution and revised instructions.

E. The Contractor shall perform work according to the manufacturer's instructions and not omit any preparatory step or installation procedure unless the instructions are specifically modified or the step or procedure exempted by the Contract Documents.

1.06 INSTALLATION OF EQUIPMENT

A. The cost of the Work shall include the cost of competent manufacturers' representatives of all equipment to supervise the installation, adjustment, and testing of the equipment and to instruct the Owner's operating personnel on operation and maintenance.

B. A certificate from the manufacturer stating that the installation of the equipment is satisfactory, that the unit has been satisfactorily tested, is ready for operation, and that the operating personnel have been suitably instructed in the operation, lubrication, and care of the unit shall be submitted before Substantial Completion.

C. The Contractor shall furnish the service of competent manufacturers' representatives for Contractor- or Owner-furnished equipment when evident malfunction or over-heating makes such services necessary or as determined by the Engineer. All such equipment shall be installed by skilled mechanics and in accordance with the instructions of the manufacturer.

D. Special care shall be taken to ensure proper alignment of all equipment with particular reference to mechanical equipment such as pumps and electric drives. These units shall be carefully aligned on their foundations by qualified millwrights after their sole or base plates have been shimmed to true alignment at the anchor bolts. The anchor bolts shall be set in place and the nuts tightened against the shims. After the manufacturer has approved the foundation alignments, the bedplates or wing feet of the equipment shall be securely bolted in place. The alignment of equipment shall be further checked after securing to the foundations. After all alignments are confirmed, the sole or base plates shall be finally grouted in place. The Contractor shall be responsible for the exact alignment of equipment with associated piping, and under no circumstances, will

"pipe springing" be allowed. Special installation requirements in the Technical Specifications shall take precedence over the requirements of this Section.

E. The Contractor shall furnish all wedges, shims, filling pieces, keys, packing, grout, or other materials necessary to properly align, level, and secure an apparatus in place. All parts intended to be plumb or level must be proven exactly so. Any grinding necessary to bring parts to proper alignment after erection shall be done at the expense of the Contractor.

F. The Contractor shall furnish the necessary materials and construct suitable concrete foundations or pads for all equipment installed by the Contractor, even though such foundations or pads may not be indicated on the Drawings. The tops of foundations shall be at such elevations as will permit grouting.

G. In setting pumps, motors, and other items of equipment customarily grouted, the Contractor shall make an allowance of at least 1 inch (2.54 cm) for grout under the equipment bases. Shims used to level and adjust the bases shall be steel. Shims may be left embedded in the grout, in which case they shall be installed neatly and so as to be as inconspicuous as possible in the completed work. Unless otherwise permitted, all grout shall be a suitable non-shrinking grout.

1. Grout shall be mixed and placed in accordance with the recommendations of the manufacturer. Where practicable, the grout shall be placed through the grout holes in the base and worked outward and under the edges of the base and across the rough top of the concrete foundation to a peripheral form so constructed as to provide a suitable chamber around the top edge of the finished foundation.
2. Where such procedure is impracticable, the method of placing grout shall be as permitted. After the grout has hardened sufficiently, all forms, hoppers, and excess grout shall be removed, and all exposed grout surfaces shall be patched in an approved manner and, if necessary, as required by the Engineer, given burlap-rubbed finish, and painted with at least two coats of an acceptable paint.

1.07 SPECIAL TOOLS

A. Manufacturers of equipment and machinery shall furnish two sets of any special tools (including grease guns or other lubricating devices) required for normal adjustment, operations and maintenance, and disassembly, together with instructions for their use. The Contractor shall preserve and deliver to the Owner these tools and instructions in good order before completing the Contract. Tools shall be high-grade, smooth, forged, alloy tool steel. Grease guns shall be lever-type.

B. Special tools are considered to be those tools which because of their limited use are not normally available, but which are necessary for the particular equipment.

C. Special tools shall be delivered at the same time as the equipment to which they pertain. The Contractor shall properly store and safeguard such special tools until completion of the work, at which time they shall be delivered to the Owner.

1.08 LUBRICATION SYSTEM

A. The minimum design criteria for lubricating moving parts of the equipment shall include 1 week of continuous operation during which no lubricants shall be added to the system.

B. The system shall be designed to receive lubricants whether in operation or shut down and shall not leak or waste lubricants under either condition. The manufacturer's recommendations of grade and quality and a supply of the lubricants so recommended in quantities sufficient to conduct start-up and testing operations shall be furnished with the equipment.

1.09 TESTS AND TEST REPORTS

A. When used in the Contract Documents, "Factory/Fabricating Shop Performance, Evaluation, Certification, and/or Acceptance Tests and Test Reports" shall be considered to mean the corresponding manufacturer’s, fabricator's, and/or other builder's official test and tests reports. Included in these test reports shall be appropriate substantiating documentation/data ascertaining the correct and complete manufacture, fabrication, and "shop performance" (to the greatest extent normally practicable) of the particular material, equipment, system, and/or facilities proposed for eventual delivery. These are subdivided into three significant tests and test report types: 1) Certification Tests and Test Reports, 2) Factory Tests and Test Reports, and 3) Shop Performance/Evaluation Tests and Test Reports. Minimal requirements are described below.

B. Certification Tests and Test Reports

1. Standard specifications, code references, etc. for minimum quality and workmanship levels are indicated in the Contract Documents and Construction Documents. Statements, certificates, and other substantiating reporting data, called "Certification Test Reports" in this Section, of tests conducted on previously manufactured materials or equipment identical to that proposed for use shall be compiled by the Contractor.
2. At a minimum all Certification Test Reports shall contain an official analysis of sufficient material composition or show evidence of meeting or exceeding the specified material standard(s) referenced, e.g., ASTM,

ASME, or other designations. All reports shall also indicate from whom the material was/will be purchased.

3. The Contractor shall pay all costs of certification tests and test reports.

C. Factory Tests and Test Reports

1. Additional tests and reports performed on material or equipment by the manufacturer or fabricator to ascertain quality or workmanship are referred to here as "Factory Tests and Test Reports."
2. Before the delivery of any Factory Test Report, the Contractor shall first submit for review and approval a detailed description of the proposed testing, including reporting procedure and criteria. Such descriptions shall also be delivered to the Engineer for review as part of the first submission of the technical submittal.
3. Materials and equipment used in the performance of the Work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. If Work to be accomplished away from the construction site is to be inspected on behalf of the Owner during its fabrication or manufacture, the Contractor shall give prior notice to the Engineer of the place and time where such fabrication or manufacture is to be done. Such notice shall be in writing and delivered to the Engineer not less than 30 days before the Work is to be done so that the necessary arrangements for the particular factory inspection tests can be made.
4. Upon completion of the factory inspection tests and immediately following manufacture or fabrication, the Contractor shall compile a complete Factory Test Report following the approved format above. All such reports shall be delivered to the Engineer for review as part of the technical submittal corresponding to such tested material or equipment.

D. Shop Performance/Evaluation Tests and Test Reports

1. Material and equipment used in the performance of the Work of this Contract are also subject to evaluation and testing after the complete full-scale assembly into major equipment and/or systems. Shop Performance/ Evaluation Tests, i.e., tests of simulated startup, steady-state, variable loading, and other normal operating conditions, for such assembled equipment/systems shall be accomplished in strict accordance with the standard testing practices specified or otherwise accepted by the Engineer.
2. Before the delivery of any Shop Performance/Evaluation Test Report, the Contractor shall submit for review a detailed description of the proposed performance/evaluation tests, including anticipated reporting procedures, data reduction, and criteria used. Where appropriate, such descriptions shall also be delivered to the Engineer for review as part of a first or subsequent submission of the technical submittal.

3. Should such performance/evaluation tests be accomplished away from the construction site, the Contractor shall give prior notice to the Engineer of the places and times where such tests will be accomplished. Such prior notice shall be in writing and delivered not less than 30 days before such events so that necessary arrangements for the particular tests can be made.
4. The requirements above pertaining to Factory Tests and Test Reports shall be incorporated for shop Performance/Evaluation Tests and Test Reports. Unless factory tests are coincident with shop performance tests and vice versa for the same material or equipment, a minimum of 15 days shall be scheduled between such multiple equipment tests where extended travel is required.

E. Cost of Performance Shop Tests

1. The Contractor shall conduct shop performance full-scale tests at its expense on all equipment as specified. Each piece of equipment shall be tested completely assembled and the shop tests performed by the equipment manufacturer until successful tests are achieved.
2. If the performance tests are conducted outside the continental United States, the Contractor shall pay all transportation expenses incurred by the Owner’s representatives in witnessing the tests at no additional cost to the Owner.

1.10 FIELD TESTING

A. Field-testing shall be conducted when called for in the Technical Specification Sections and on all completed systems in general. The Contractor shall provide services of a factory-authorized service representative to perform, approve, and certify the field testing specified in this Section. Field testing shall generally consist of performing the pre-startup and startup tests and the final mechanical performance test as specified in the Contract Documents. The Contract Documents may require the Contractor to perform factory testing on equipment items before the Engineer approves their use for this project. The Contractor shall refer to the Contract Documents regarding equipment shop testing requirements.

B. After completing the installation, the Contractor shall test the system in the presence of the Engineer and under actual operating conditions. Tests shall be performed according to the manufacturer's recommendations.

C. The Contractor shall include with its bid the services of the equipment manufacturer's field service technician for a period necessary to complete the Work to the satisfaction of the Engineer and the Owner.

D. This service shall be for the purposes of checkout, initial start-up, certification, and instruction of facilities personnel.

E. A written report covering the technician's findings and installation approval shall be submitted to the Engineer covering all inspections and outlining in detail any deficiencies noted.

1.11 ACCEPTANCE OF INSTALLATION

A. The Engineer may accept an equipment system installation as ready for Substantial Completion when:

1. The Engineer has accepted all factory tests and all other component testing.
2. The Engineer has accepted all performance shop tests.
3. All components of the system are installed and tested, including without limitation hydrostatic tests, leak tests, continuity tests, insulation resistance tests, phase rotation tests, bump tests, stroke testing, calibration, adjustment for proper operation, and all other component tests as appropriate.
4. Field start-up activities have been completed and approved by the Engineer.
5. The appropriate certificates have been submitted.
6. All equipment has met the performance requirements.
7. The Engineer has accepted integrated system tests and adjustments performed by the Contractor to demonstrate that the system as a whole functions reliably and meets the performance requirements, in manual and automatic modes, without failure, fault, or defect of any component or of the system as a whole.
8. The Engineer has accepted integrated facilities tests performed by the Contractor to demonstrate that the entire Construction functions together reliably as an integrated facility and meets the performance requirements, in manual and automatic modes, without failure, fault, or defect of any component.
9. The Engineer has accepted facilities performance tests which demonstrate that the design criteria and performance criteria are met.
10. The Engineer has accepted the O&M Manuals.
11. All required Owner personnel have been trained.
12. All other Contract requirements for Substantial Completion have been satisfied.

1.12 GREASE, OIL, AND FUEL

A. All grease, oil, and fuel required for start-up and testing of equipment shall be furnished with the respective equipment.

B. The Contractor shall be responsible for changing the oil in all drives and intermediate drives of each mechanical equipment from after initial break-in of the equipment, which shall be no greater than 30 days.

1.13 ELECTRICAL EQUIPMENT ENCLOSURES

A. All items of electrical equipment that are furnished with process, heating, ventilating, or other equipment shall conform to the requirements as applicable. Enclosures for electrical equipment, such as switches and starters, shall conform to the requirements as applicable.

1.14 EQUIPMENT DRIVE GUARDS

A. Screens, guards, or cages shall be provided for all exposed rotating or moving parts in accordance with accepted practices of applicable governmental agencies. Unless specified otherwise in the technical sections, guards shall be constructed of galvanized sheet steel or galvanized woven wires or expanded metal set in a frame of galvanized steel members. Guards shall be secured in position by steel braces or straps, which will permit easy removal for servicing the equipment.

1.15 PROTECTION AGAINST ELECTROLYSIS

A. Where dissimilar metals are used in conjunction with each other, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous-impregnated felt, heavy-bituminous coatings, nonmetallic separators or washers, or other acceptable materials.

1.16 CONCRETE INSERTS

A. Concrete inserts for hangers shall be designed to support safely, in the concrete that is used, the maximum load that can be imposed by the hangers used in the inserts. Inserts for hangers shall be of a type which will permit adjustment of the hangers both horizontally (in one plane) and vertically and locking of the hanger head or nut. All inserts shall be galvanized.

1.17 SLEEVES

A. Unless otherwise indicated on the Drawings or specified, openings for the passage of pipes through floors and walls shall be formed of sleeves of standard-weight, galvanized-steel pipe. Each sleeve shall be of ample diameter to pass the pipe and its insulation, if any, and to permit such expansion as may occur. Sleeves shall be of sufficient length to be flush at the walls and the bottom of the slabs and to project 2 inches above the finished floor surface. Threaded nipples shall not be used as sleeves.

B. Sleeves in exterior walls below ground or in walls to have liquids on one or both sides shall have a 2-inch annular fin of 1/4-inch plate welded with a continuous weld completely around the sleeve at about mid-length. Sleeves shall be galvanized after the fins are attached.

C. All sleeves shall be set accurately before the concrete is placed or shall be built-in accurately as the masonry is being built.

1.18 SERVICES OF MANUFACTURER'S REPRESENTATIVE

A. The Contractor shall arrange for a qualified service representative from each company manufacturing or supplying certain equipment as listed in this Section (or in the respective Technical Specification sections) to perform the duties described in this Section.

B. After the listed equipment has been installed and the equipment is presumably ready for operation but before it is operated by others, the representative shall inspect, operate, test, and adjust the equipment. The inspection shall include but not be limited to the following points as applicable:

1. Soundness (without cracked, abraded, or otherwise damaged parts).
2. Completeness in all details, as specified.
3. Correctness of setting, alignment, and relative arrangement of various parts.
4. Adequacy and correctness of packing, sealing, and lubricants.

C. The operation, testing, and adjustment shall be as required to prove that the equipment is left in proper condition for satisfactory operation under the conditions specified.

D. On completion of his or her work, the manufacturer's or supplier's representative shall submit in triplicate to the Engineer a complete, signed report of the result of the inspection, operation, adjustments, and tests. The report shall include detailed descriptions of the points inspected, tests and adjustment made, quantitative

results obtained if such are specified, and suggestions for precautions to be taken to ensure proper maintenance. The report also shall include a certificate that the equipment conforms to the requirements of the Contract and is ready for permanent operation and that nothing in the installation will render the manufacturer's warranty null and void.

E. After the Engineer has reviewed the reports from the manufacturer's representatives, the Contractor shall make arrangements to have the manufacturer's representatives present when the field acceptance tests are made.

F. The Contractor, at a minimum, shall arrange for the service of qualified service representatives from the companies manufacturing or supplying the following equipment and as required in the Technical Specifications:

1. Pumping Equipment.
2. Instrumentation and Control Systems.
3. Programmable Controllers.
4. Hoisting Equipment.
5. Electric Motors.
6. Motor Control Centers.
7. Flow Meters.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01650
DELIVERY, STORAGE, AND HANDLING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section specifies the general requirements for the delivery, handling, storage, and protection of all items required in the construction of the Work. Specific requirements, if any, are specified with the related item.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in this Section for storing and protecting the items.

B. The Contractor shall do the following:

1. Materials and equipment shall be loaded and unloaded by methods affording adequate protection against damage. Every precaution shall be taken to prevent injury to the material or equipment during transportation and handling. Suitable power equipment shall be used and the material or equipment shall be under control at all times. Under no condition shall the material or equipment be dropped, bumped, or dragged. When a crane is used, a suitable hook or lift sling shall be used. The crane shall be so placed that all lifting is done in a vertical plane. Materials or equipment skid loaded, palletized, or handled on skidways shall not be skidded or rolled against material or equipment already unloaded.

2. Material and equipment shall be delivered to the job site by means that will adequately support it and not subject it to undue stresses. Material and equipment damaged or injured in the process of transportation unloading or handling shall be rejected and immediately removed from the site.

3. The Contractor shall coordinate the delivery of all materials, including those furnished by the Owner. The Contractor shall be responsible for the proper transport, handling, and storing of all materials, and materials shall be protected to ensure their expected performance. Delivery schedules

shall be coordinated by the Contractor, in advance, so that the Work will be done in a timely manner.

4. The Contractor shall coordinate deliveries of products with construction schedules to avoid conflict with work and conditions at the site. The Contractor shall also do the following:

    a. Deliver products in undamaged condition, in the manufacturer's original containers or packaging, with identifying labels intact and legible.
    b. Immediately on delivery, inspect shipments to ensure compliance with requirements of the Contract Documents and approved submittals and to ensure that the products are properly protected and undamaged.

5. The Contractor shall provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

6. All materials and equipment shall be stored on-site in complete compliance with the manufacturer’s recommendations.

7. Store products subject to damage by the elements in weather-tight enclosures.

8. Maintain temperature and humidity within the ranges required by the manufacturer's instructions.

9. Store fabricated products above the ground, on blocking or skids to prevent soiling or staining. Cover products that are subject to deterioration with impervious sheet coverings, and provide adequate ventilation to avoid condensation.

10. All materials and equipment to be incorporated in the Work shall be handled and stored by the Contractor before, during, and after shipment in a manner that will prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft, or damage of any kind to the material or equipment.

11. All materials which, in the opinion of the Engineer, have become so damaged as to be unfit for the use intended or specified shall be promptly removed from the site of the Work, and the Contractor shall receive no compensation for the damaged material or its removal.

12. The Contractor shall arrange storage in a manner to provide easy access for inspection and make periodic inspections of stored products to ensure that products are maintained under specified conditions, free from damage or deterioration.

13. The Contractor shall provide substantial coverings as necessary to protect installed products from traffic damage and subsequent construction operations and shall remove these coverings when they are no longer needed.

14. Should the Contractor fail to take proper action on storage and handling of equipment supplied under this Contract, within 7 days after written notice to do so has been given, the Owner retains the right to correct all deficiencies noted in the previously transmitted written notice and deduct the cost associated with these corrections from the Contractor's Contract. These costs may include expenditures for labor, equipment use, administrative, clerical, engineering, and any other costs associated with making the necessary corrections.

15. Schedule delivery to reduce long-term onsite storage before installation and/or operation. Under no circumstances shall equipment be delivered to the site more than 1 month before installation without written authorization from the Engineer.

16. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged, or sensitive to deterioration.

17. Deliver products to the site in the manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting, and installing.

18. Unload and place all items delivered to the site in a manner which will not hamper normal construction operation nor that of subcontractors and other contractors and will not interfere with the flow of necessary traffic.

19. Provide necessary equipment and personnel to unload all items delivered to the site.

20. The Contractor shall store and protect products in accordance with the manufacturer's instructions, with seals and labels intact and legible. Follow storage instructions, review them with the Engineer, and keep a written record of this. Arrange storage to permit access for inspection.

21. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

22. Store cement and lime under a roof and off the ground and keep it completely dry at all times. All structural, miscellaneous, and reinforcing steel shall be stored off the ground or otherwise to prevent accumulations of dirt or grease and in a position to prevent accumulations of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping, or cracking. Handle and store brick, block, and similar masonry products in a manner to keep breaking, cracking, and spilling to a minimum.

23. Store all mechanical and electrical equipment and instruments subject to corrosive damage by the atmosphere if stored outdoors (even though covered by canvas) in a weathertight building to prevent damage. The building may be a temporary structure on the site or elsewhere, but it must be satisfactory to the Engineer. The building shall be provided with adequate ventilation to prevent condensation. The Contractor shall ensure that temperature and humidity are maintained within the range required by the manufacturer.

    a. All equipment shall be stored fully lubricated with oil, grease, and other lubricants unless otherwise instructed by the manufacturer.
    b. Moving parts shall be rotated a minimum of once weekly to ensure proper lubrication and to avoid metal-to-metal "welding." Upon installation of the equipment, the Contractor shall start the equipment, at least at half load, once weekly for an adequate period to ensure that the equipment does not deteriorate from lack of use.
    c. Lubricants shall be changed when installation is complete and as frequently as required thereafter during the period between installation and acceptance. The Contractor shall put new lubricants into the equipment at the time of acceptance.
    d. Before accepting equipment that has been stored for some time, the Contractor shall have the manufacturer inspect the equipment and certify that its condition has not been detrimentally affected by the long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested, and accepted in a minimum time period. As such, the manufacturer will guarantee the equipment equally in both instances. If such a certification is not

given, the equipment shall be judged to be defective. It shall be removed and replaced at the Contractor's expense.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01720
FIELD ENGINEERING

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall do the following:

A. Provide and pay for the following field engineering services required for the Project:

1. Survey work required in the execution of the Project.
2. Civil, structural, or other professional engineering services specified or required to execute the Contractor’s construction methods.

B. Retain the services of a registered land surveyor licensed in Florida to do the following:

1. Identify existing control points and property line corner stakes as required.
2. Verify all existing structure locations and all proposed structure corner locations, tank locations, and equipment locations within the Project site.
3. Maintain an accurate location of all buried piping 4 inches in diameter and larger.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. The Contractor shall submit to the Engineer the name and address of the registered land surveyor or professional engineer.

C. On request of the Engineer, the Contractor shall submit documentation to verify the accuracy of field engineering work.

D. The Contractor shall submit a certificate signed by a registered land surveyor certifying that elevations and locations of improvements are in conformance or non-conformance with Subcontract Documents.

E. At the end of the Project and before final payment, submit the certified drawings listed below with the Surveyor's title block (signed and sealed by the registered

land surveyor) of the items listed below. These drawings shall be included with and made a part of the project record documents.

1. Certified site survey at 1-inch = 10-foot scale on sheets 24 inches by 36 inches, indicating the building corners, sidewalks, paved areas, and location of all above-ground structures for the project site.
2. Certified drawing showing the location, lines, and grades of all lines 4 inches in diameter and larger buried and exterior to buildings and other buried facilities (e.g., valves, tanks, vaults) installed as a result of the work. This shall be at the same scale as the Engineer's yard piping drawing and submitted on reproducible tracing paper.
3. Certified drawings showing elevations of all flow control points such as weirs, elevations of all existing and new structures, and equipment.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. All work will be performed in accordance with the Minimum Technical Standards set forth by the Board of Professional Surveyors and Mappers.

1.04 QUALITY ASSURANCE

A. Existing basic horizontal and vertical control points for the project are those designated on Drawings.

B. Locate and protect control points before starting site work and preserve all permanent reference points during construction:

1. Make no changes or relocations without prior written notice to the Engineer.
2. Report to the Engineer when any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.
3. Require the surveyor to correctly replace project control points which may be lost or destroyed.
4. Establish replacements based on original survey control.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 QUALIFICATIONS

A. Registered land surveyor of the discipline required for the specific service on the project, currently licensed in Florida.

1.08 SYSTEM DESCRIPTION

A. The Contractor shall establish a minimum of five (5) permanent benchmarks on the site, referenced to data established by survey control points:

1. Record locations, with horizontal and vertical data, on Record Documents.

B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:

1. Site improvements:

a. Stakes for grading, fill, and topsoil placement.
b. Utility slopes and invert elevations.

2. Foundation and floor levels.

3. Controlling lines and levels required for mechanical and electrical trades.

C. From time to time, verify layouts by the same methods.

D. Maintain a complete and accurate log of all control and survey work as the work progresses.

E. As a condition for approval of monthly progress payment requests, update the project record drawings monthly based on the work performed during the month ending at the pay request. The Contractor shall coordinate this monthly with the Owner's representative on the site as part of the pay request.

F. Maintain an accurate record of piping changes, revisions, and modifications.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01740
FINAL CLEANING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall execute cleaning during progress of the Work and at the completion of the Work as required by General Conditions.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 ENVIRONMENTAL CONCERNS

A. Cleaning and disposal operations shall comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 PRODUCTS

2.01 CLEANING MATERIALS

The Contractor shall do the following:

A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by the manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by the cleaning material manufacturer.

PART 3 EXECUTION

3.01 PERIODIC CLEANING

The Contractor shall do the following:

A. Execute periodic cleaning to keep the work, the site, and adjacent properties free from accumulations of waste materials, rubbish, and windblown debris.

B. Provide onsite containers for the collection of waste materials, debris, and rubbish.

C. Remove waste materials, debris, and rubbish from the site periodically and dispose of at legal areas away from the site.

3.02 DUST CONTROL

The Contractor shall do the following:

A. Clean interior spaces before the start of finish painting and continue cleaning on an as-needed basis until painting is finished.

B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.

3.03 FINAL CLEANING

The Contractor shall do the following:

A. Employ skilled workers for final cleaning.

B. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from interior and exterior surfaces exposed to view.

C. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.

D. Before final completion or Owner occupancy, inspect interior and exterior surfaces exposed to view and all work areas to verify that the entire Work is clean.

END OF SECTION

SECTION 01770
PROJECT CLOSEOUT

PART 1 GENERAL

1.01 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.02 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.03 SUBSTANTIAL COMPLETION

A. When the Contractor considers that the Work or designated portion of the Work is Substantially Complete, the Contractor shall submit written notice to the Engineer with a list of items to be completed or corrected.

B. If the Engineer's inspection finds that the Work is not substantially complete, the Engineer will promptly notify the Contractor in writing, listing observed deficiencies.

C. The Contractor shall remedy deficiencies and send a second written notice of Substantial Completion.

D. When the Engineer finds the Work is Substantially Complete the Engineer will prepare a Certificate of Substantial Completion.

1.04 FINAL COMPLETION

A. When the Contractor considers that the Work or designated period of the Work is complete, the Contractor shall submit written certification to the Engineer indicating the following:

1. The Contract Documents have been reviewed.
2. The Work has been inspected for compliance with the Contract Documents.

3. The Work has been completed in accordance with the Contract Documents and deficiencies listed with Certificates of Substantial Completion have been corrected.
4. The Work is complete and ready for final inspection.
5. All required shop drawings, catalog cuts, maintenance manuals, instruction manuals, test reports, samples, operational manuals, and all other submittals have been submitted and reviewed by the Engineer.
6. All deliverables have been delivered or placed as accepted by the Engineer.

B. If the Engineer's inspection reveals that the Work is incomplete, the Engineer will promptly notify the Contractor in writing listing observed deficiencies.

C. The Contractor shall remedy deficiencies and send a second certification of Final Completion.

D. When the Engineer finds that the Work is complete, the Engineer will consider closeout submittals.

1.05 REINSPECTION FEES

A. If the status of Completion of Work requires more than one re-inspection by the Engineer due to failure of the Work to comply with the Contractor's claims on initial inspection, the Owner will deduct from the final payment to the Contractor the amount of the Engineer's compensation for additional re-inspection services.

1.06 CLOSEOUT SUBMITTALS

A. Evidence of Compliance with Requirements of Governing Authorities:

1. Certificate of Occupancy.
2. All required Certificates of Inspection.

B. Operation and Maintenance Manuals: Under provisions of Section 01830, Operations and Maintenance Manuals.

C. Record Documents: Under provisions of Section 01785, Record Documents.

D. Evidence of Payment and Release of Liens: In accordance with Conditions of the Contract.

E. Consent of Surety to Final Payment.

1.07 STATEMENT OF ADJUSTMENT OF ACCOUNTS

A. Submit final statement reflecting adjustments to total Contract Price, indicating the following:

1. Original total Contract Price.
2. Previous change orders.
3. Changes under allowances.
4. Changes under unit prices.
5. Deductions for uncorrected Work.
6. Penalties and bonuses.
7. Deductions for liquidated damages.
8. Deductions for re-inspection fees.
9. Other adjustments to total Contract Price.
10. Total Contract Price as adjusted.
11. Previous payments.
12. Sum remaining due.

B. The Engineer will issue a final Change Order reflecting approved adjustments to the total Contract Price not previously made by change orders.

1.08 APPLICATION FOR FINAL PAYMENT

A. Submit application for final payment in accordance with provisions of Conditions of the Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01780
WARRANTIES AND BONDS

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall do the following:

A. Compile specified warranties and bonds.
B. Co-execute submittals when so specified.
C. Review submittals to verify compliance with Contract Documents.
D. Submit submittals to the Engineer for review.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Assemble warranties, bonds, and service and maintenance contracts executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Number of original signed copies required: two each.

C. Table of Contents: Neatly typed, in sequence of the Specifications. Provide completion information for each item as follows:

1. Product or work item.

2. Firm, address, telephone and fax numbers, and name and email of principal.

3. Scope.

4. Date of beginning of warranty, bond, or service and maintenance contract.

5. Duration of warranty, bond, or service and maintenance contract.

6. Provide information for Owner's personnel:

a. Proper procedure in case of failure.
b. Instances that might affect the validity of warranty or bond.

7. Contractor, with address, telephone and fax numbers, and the name and email of responsible principal.

D. Submittal of warranties, bonds, and service and maintenance contracts shall be included in submittals for review and before Final Completion with actual dates included.

E. The Contractor's obligation to correct defective or nonconforming Work shall run for 1 year (or such longer period may otherwise be specified in the Contract Documents) beginning from the date Substantial Completion is achieved.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and this Section.

B. All mechanical and electrical equipment together with devices of whatever nature and all components which are furnished and/or installed by the Contractor shall be guaranteed.

C. The guarantee shall be against the manufacturing and/or design inadequacies, materials, and workmanship not in conformity, improper assembly, hidden damage, failure of devices and/or components, excessive leakage, or other circumstances which would cause the equipment to fail under normal design and/or specific operating conditions for 1 year or such longer period as may be shown and/or specified from and after the date of Substantial Completion.

D. The Contractor shall replace and install each piece of equipment, device, or component which shall fail within the term specified above of the guarantee with reasonable promptness without increase in the Contract Price. If the Contractor fails to provide timely repairs as specified in this Section, the Owner shall issue a claim against the Contractor's Bond. In some instances, if approved by the Owner, the Contractor may be allowed to repair the equipment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01785
RECORD DOCUMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section details the minimum requirements for the Contractor for maintenance and recording of Record Documents.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. The Contractor shall store documents and samples in the Contractor's field office apart from documents used for construction and shall do the following:

1. Provide files and racks for storage of documents.
2. Provide cabinet or secure storage space for storage of samples.

B. The Contractor shall institute a computerized record control program.

C. The Contractor shall make documents and samples available at all times for inspection by the Engineer.

D. At Contract closeout, the Contractor shall transmit Record Documents and samples with cover letter to the Engineer, listing the following:

1. Date.
2. Project title and number.
3. Contractor's name and addresses.
4. Number and title of each Record Document.
5. Signature of Contractor or its authorized representative.
6. Contract Section and Subsection numbers.
7. Location.

E. Before assembling and submitting records, the Contractor shall review for completeness the records maintained by its subcontractors.

F. Tracings of all Construction Documents and Shop Drawings made by the Contractor, subcontractors, and suppliers of materials or equipment shall be corrected to show the Work as actually completed or installed.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 PROJECT RECORD

A. The Contractor shall label and file Record Documents and samples in accordance with the corresponding Specification Section number. Each document shall be labeled “PROJECT RECORD” in neat, large, printed letters. Record Documents shall be maintained in a clean, dry, and legible condition. Record Documents shall not be used for construction purposes.

3.02 RECORDING

The Contractor shall record construction information as follows:

A. Record and update daily Record information from field notes on a set of opaque drawings and to the satisfaction of the Engineer.

B. Provide felt tip marking pens, maintaining separate colors for each major system, for recording information.

C. Record information concurrently (daily) with construction progress. Work shall not be concealed until required information is recorded.

D. Mark Record Drawings to reflect the following:

1. Measured horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements.
2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
3. Field changes of dimension and detail.

4. Changes made by modifications.
5. Details not on original construction drawings.

E. CAD Requirements for Record Drawings: The Contractor shall provide the Engineer with a complete set of Record Drawings in the version of AutoCAD format specified by the Engineer upon completion of the Work. No additional compensation will be allowed for the Contractor to provide the Record Drawings. The Contractor shall use the AutoCAD drawings furnished by the Engineer for this purpose. Record Drawings must be submitted in the AutoCAD format of the contract drawings. No other CAD software or format will be accepted. It is the Contractor's sole responsibility to ensure that the Record Drawings conform to the following CAD requirements:

1. Drawings shall be submitted to the Engineer on CD-ROM. Each CD shall be clearly labeled with the appropriate project number, client name, date, and file names included on each CD. If files are compressed, a description of the compression software must be included along with a copy of the appropriate uncompressing software.
2. All changes to drawings must be done in accordance with the appropriate scale of the drawing revised and shall be delineated by placing a "cloud" around the areas revised and adding a revision triangle indicating the appropriate revision number.
3. Each drawing must have the revision block completed to indicate the revision number, date, and initials of the person revising the drawing. The description of the revision must say "Record Drawing." This procedure must be followed for every drawing even when no changes are made to the drawing.
4. All revisions to drawings must be put on separate layers with the layer names prefixed Record followed by the appropriate existing layer name. The colors and line types of the appropriate existing layers shall be adhered to when creating new layers.
5. The Contractor shall supply one full set of Record Drawings on reproducible black line prints and five full sets of opaque copies.

F. The Contractor shall have the Licensed Land Surveyor certify the Record Drawings as being correct and complete.

END OF SECTION

SECTION 01830
OPERATIONS AND MAINTENANCE MANUALS

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall do the following:

A. Compile product data and related information appropriate for the Owner's maintenance and operation of products furnished under the Contract.

1. Prepare operating and maintenance data as specified in this Section and as referenced in other pertinent Sections of the Specifications. The data presented in the Operations and Maintenance (O&M) Manuals shall be specifically related to this Contract and application.
2. Incorporate maintenance and operation data furnished by the Owner, if any.

B. Furnish all labor, equipment, materials, and all other items to supply and deliver to the Engineer O&M Manuals for the Work in accordance with the requirements of this Section.

C. Provide O&M Manuals for all equipment, including instrumentation, electrical, and process control system equipment and software for the entire Facility.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Manuals which, in general, shall have two levels: a facilities-wide systems level and an individual-component level.

1. The facilities-wide systems level shall do the following:

a. Describe the facilities-wide systems, including diagrams.
b. Explain start-up, shutdown, normal operations, and malfunctions of the facilities-wide systems.
c. Tabulate a lubrication schedule for the facilities-wide systems.
d. Describe preventive maintenance checking procedures for the facilities-wide systems.
e. Include a cross-reference to all individual component manuals.

2. The individual-component level shall contain the following:

    a. Storage requirements.
    b. Installation instructions.
    c. Alignment instructions and tolerances.
    d. Operating instructions.
    e. Troubleshooting instructions.
    f. Lubrication requirements.
    g. Maintenance instructions.
    h. Parts list.
    i. Recommended spare parts list and how to obtain same.

B. Format:

1. Size: 8 1/2 x 11 inch (21.59 x 27.94 cm).

2. White paper: 20-lb (9.072 kg) minimum.

3. Text: Manufacturer's printed data or neatly word-processed.

4. Drawings:

    a. Provide reinforced, punched binder tab, bind in with text.
    b. Reduce larger drawings and fold to size of text pages but not larger than 11 x 17 inches (27.94 x 43.18 cm).
    c. Place all drawings at the end of each Section and drawing shall be printed on one side only.

5. Provide a blank page for each separate product or each piece of operation equipment.

    a. Provide a word-processed description of the product and major component parts of equipment.
    b. Provide indexed tabs.

6. Cover: Identify each volume with typed or printed title, "OPERATION AND MAINTENANCE INSTRUCTIONS," listing the following:

    a. Title of Project.
    b. Identity of separate structure as applicable.
    c. Identity of general subject matter covered in the manual.

C. Media

1. Original word-processed CD shall be delivered to the Engineer.
2. All word processing must be done using the latest version of Microsoft Word or as directed by the Engineer.
3. All drawings except control system configuration drawings must be submitted on CD using AutoCAD.

D. Binders

1. Filled to not more than 75% capacity.
2. When multiple binders are used, arrange the data into related consistent groupings.

E. The Contractor shall submit the following:

1. Preliminary O&M Manuals—Five copies of the O&M Instruction Manual for each piece of equipment shall be submitted to the Engineer before delivery of the equipment for review by the Engineer. O&M manuals will not include the manufacturer's test results and Record specifications.
2. Final O&M Manuals—Five copies of the Final Equipment and Systems O&M Manuals, bound and indexed and submitted to the Engineer before the Substantial Completion under this Contract.
3. The cost of these Manuals submitted shall be included in the total Contract Price. Copies supplied under Item 1 will not be included under Item 2.

F. Any modifications required after final O&M submission shall be made to the manuals by issuance of addenda in the form of change pages to the manual. The addenda will identify where the new data are to be inserted, what data are to be removed, and new index sheets as necessary and list of shop drawings and submittals.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to herein shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Administrative Code, 62-555.350, "Operation and Maintenance of Public Water Systems."

B. Florida Administrative Code, 62-600.410, "Operation and Maintenance of Domestic Wastewater Facilities."

1.04 QUALITY ASSURANCE

A. Data shall be prepared by personnel:

1. Trained and experienced in maintaining and operating the described products.
2. Familiar with requirements of this Section.
3. Skilled as a technical writer to the extent required to communicate essential data.
4. Skilled as a draftsman competent to prepare required drawings.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 CONTENTS, EACH VOLUME

A. Neatly word-processed table of contents for each volume, arranged in systematic order, to include the following:

1. Contractor, name of responsible principal, address, fax number, and telephone number.

2. A list of each product required to be included, indexed to content of the volume.

3. A list with each product, name, address, fax number, and telephone number of the following:

a. Subcontractor or installer.
b. A list of each product to be included, indexed to content of the volume.
c. Identify area of responsibility of each subcontractor or installer, if more than one.
d. Local source of supply for parts and replacement.
e. Manufacturer.

4. Identify each product by product name and other identifying symbols as set forth in the Contract Documents.

B. Product Data

1. Include only those sheets that are pertinent to the specific product.

2. Annotate each sheet to achieve the following:

a. Clearly identify the specific product or part installed.
b. Clearly identify data applicable information.
c. Delete references to inapplicable information.

C. Drawings

1. Supplement product data with drawings as necessary to illustrate the following clearly:

a. Relations of component parts of equipment and systems.
b. Control and flow diagrams.
c. Owner Tag Numbers.

2. Coordinate drawings with information in Record Documents to ensure correct illustration of completed installation.

3. Do not use Record Documents as maintenance drawings.

D. Written text as required to supplement product data for the particular installation:

1. Organize in consistent format under separate headings for different procedures.
2. Provide a logical sequence of instructions for each procedure.
3. Describe how the complete system is to operate.

E. Copy of pertinent information related to warranty, bond, and service Contract issued.

1. Provide information sheet for Owner's personnel with the following information:

a. Proper procedures in event of failure.
b. Instances that might affect the validity of warranties or bonds.

F. Training manuals used in training courses will become part of this Manual.

1.08 MANUAL FOR MATERIALS AND FINISHES

A. Content, for applied materials and finishes:

1. Manufacturer's data, giving full information on products:

a. Catalog number, size, composition.
b. Color and texture designations.
c. Information required for re-ordering special-manufactured products.

2. Instructions for care and maintenance:

a. Manufacturer's recommendation for types of cleaning agents and methods.
b. Cautions against cleaning agents and methods that are detrimental to product.
c. Recommended schedule for cleaning and maintenance.

B. Content, for moisture-protected and weather-exposed products:

1. Manufacturer's data, giving full information on products:

a. Applicable standards.
b. Chemical composition.
c. Details of installation.

2. Instructions for inspection, maintenance, and repair.

C. Additional requirements for maintenance data as required by other Sections of the Specifications.

1.09 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Content, for each electrical, mechanical, instrumentation, and communication system, as appropriate:

1. A table identifying each piece of equipment, each associated control or instrument, the location of the control or instrument, and the function of the control or instrument.

2. A description of the system and its component parts:

    a. Function, normal operating characteristics, and limiting conditions for the system, the sub-system, and the component parts.
    b. Performance curves, engineering data, and tests.
    c. Complete nomenclature and commercial numbers of replaceable parts.

3. Circuit directories of panel board:

    a. Electrical service.
    b. Controls.
    c. Communications.

4. As-installed color-coded wiring diagrams.

5. Instrument loop diagrams showing the path that a control or instrumentation signal takes from its origin to the action it takes.

    a. An electrical schematic for each item.
    b. A chart listing the controls/instruments in a loop identifying the equipment's abbreviated symbol, a description of the symbol, design criteria, process flow, quantity supplied, and manufacturer's model and serial number.

6. Operating procedures:

    a. Routine and normal operating instructions.
    b. Sequences required.
    c. Special operating instructions.

7. Maintenance procedures:

    a. Routine operations.
    b. Guide to "trouble-shooting."
    c. Disassembly, repair, and re-assembly.
    d. Alignment, adjustment, and checking.

8. The manufacturer's printed operating and maintenance instructions.

9. A list of the original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

10. Other data as required under other Sections of the Specifications.

11. Abnormal and emergency operations:

    a. Potential overloads.
    b. Procedures for equipment breakdown.
    c. Action to be taken in a power outage.
    d. Identity of alarms by equipment location and action to correct.
    e. Equipment safety features, requirements, and potential hazards.

12. Programming manuals for programmable devices including list of standard programming.

B. Content, for each unit of equipment and system, as appropriate:

1. Description of unit and component parts:

    a. Function, normal operating characteristics, and limiting conditions.
    b. Performance curves, engineering data, and tests.
    c. Complete nomenclature and commercial number of replaceable parts.
    d. Model number and name plate data for each piece of equipment.
    e. Assembly drawings.
    f. List of all special tools required to service equipment and/or systems including where the tools are stored.

2. Operating procedures:

    a. Start-up, break-in, routine, and normal operating instructions.
    b. Regulation, control, stopping, shut-down, and emergency instructions.
    c. Summer and winter operating instructions.
    d. Special operating instructions.
    e. Control settings and ranges.

3. Maintenance procedures:

    a. Type and frequency of preventive maintenance activities required for each piece of equipment.
    b. Guide to "trouble-shooting."
    c. Disassembly, repair, and re-assembly.
    d. Alignment, adjusting, and checking.

4. Servicing and lubrication schedule:

    a. List of lubricants required.
    b. Period between lubrications.

5. Manufacturer's printed operating and maintenance instructions. (This is not to be a generalized catalog of the entire product line.)

6. Description of sequence of operation.

7. The original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance:

    a. Predicted life of parts subject to wear.
    b. Items recommended to be stocked as spare parts.

8. As-installed control diagrams.

9. Each Contractor's coordination drawings.

10. List of the original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

11. Other data as required under pertinent Sections of the Specifications.

12. Charts of equipment, instrument, and valve tag numbers with location and function:

    a. Reference drawing which shows equipment, instrument, or valve location.
    b. Manufacturer's model and serial number.
    c. Valve actuator type (manual, hydraulic, electric, or pneumatic).

13. Local services (process water and air, drains, HVAC, natural gas and steam).

C. The Contractor shall prepare and include additional data when the need for such data becomes apparent during instruction of the Owner's personnel.

D. Additional requirements for O&M data required by other Sections of the Specifications.

PART 2 PRODUCTS

2.01 O&M MANUALS

A. Binders: The manuals shall be supplied in binders that are the same as those provided in Paragraph 1.03.D above.

B. Electronic Version: Word-processed portions of the manuals shall also be provided on CDs. The electronic version manuals must be capable of being read, edited, and printed with Microsoft Word or Owner-approved file format at the time of the transmittal of documents. The format will be provided to the Contractor upon request. All drawings shall be generated using personal computer and plotter with the software package program from AutoCAD.

PART 3 EXECUTION (NOT USED)

END OF SECTION

DIVISION 2

SITE CONSTRUCTION

SECTION 02000
REFERENCED FDOT SPECIFICATIONS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to provide for the construction where indicated on the Drawings.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product data for reinforced concrete pipe, along with gaskets, is required to indicate performance in accordance with the specifications.

B. Shop drawings for drainage structures including curb inlets, ditch bottom inlets, manholes, and mitered end sections is required to indicate performance in accordance with the specifications. Include shop drawings for frames, covers, and grates with each drainage structure.

C. Submit maintenance of traffic plan(s) for each phase of construction.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Specification Section shall be the latest revision of any such document in effect at the bid time, unless otherwise noted. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section. The referenced FDOT Standard Specifications that apply to this project include the following sections along with the sections referenced within these sections:

- 102 Maintenance of Traffic

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this contract.

2. Payment for this project is in accordance with the Bid Form.
3. Additional requirements superseding the applicable portions of the above FDOT Standard Specifications are provided in the subsequent sections of these Technical Specifications.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Specification Section 01780, Warranties and Bonds.

PART 2 PRODUCTS

2.01 GENERAL

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section. The referenced FDOT Standard Specifications that apply to this project include the following sections along with the sections referenced within these sections:

- 102 Maintenance of Traffic

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this contract.
2. Payment for this project is in accordance with the Bid Form.
3. Additional requirements superseding the applicable portions of the above FDOT Standard Specifications are provided in the subsequent sections of these Technical Specifications.

PART 3 EXECUTION

3.01 GENERAL

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section. The referenced FDOT

Standard Specifications that apply to this project include the following sections along with the sections referenced within these sections:

- 102 Maintenance of Traffic

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this contract.
2. Payment for this project is in accordance with the Bid Form.
3. Additional requirements superseding the applicable portions of the above FDOT Standard Specifications are provided in the subsequent sections of these Technical Specifications.

END OF SECTION

SECTION 02230
SITE PREPARATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, and equipment required and perform all site preparation, complete as shown on the Drawings and as specified in this Section.

B. The Contractor shall obtain all permits required for site preparation before proceeding with the work, including clearing and tree removal.

C. The areas to be cleared, grubbed, and stripped within public rights-of-way and utility easements shall be minimized to the extent possible for the scope of pipeline work and in consideration of the actual means and methods of construction used. No unnecessary site preparation shall be performed within these areas.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. Submit to the Engineer copies of all permits required before clearing, grubbing, and stripping work.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 CLEARING

A. The Contractor shall cut and remove all timber, trees, stumps, brush, shrubs, roots, grass, weeds, rubbish, and any other objectionable material resting on or protruding through the surface of the ground.

B. The Contractor shall preserve and protect trees and other vegetation designated on the Drawings or directed by the Engineer to remain as specified below.

3.02 GRUBBING

A. The Contractor shall grub and remove all stumps, roots in excess of 1-1/2 inches in diameter, matted roots, brush, timber, logs, concrete rubble, and other debris encountered to a depth of 18 inches below original grade or 18 inches beneath the bottom of foundations, whichever is deeper.

B. The Contractor shall refill all grubbing holes and depressions excavated below the original ground surface with suitable materials and compact to a density conforming to the surrounding ground surface in accordance with Section 02305, Earthwork for Utilities.

3.03 STRIPPING

A. The Contractor shall strip topsoil from all areas to be occupied by buildings, structures, and roadways and all areas to be excavated or filled.

B. Topsoil shall be free from brush, trash, large stones, and other extraneous material. Avoid mixing topsoil with subsoil.

C. The Contractor shall stockpile and protect topsoil until it is used in landscaping, loaming, and seeding operations and dispose of surplus topsoil after all work is completed.

3.04 DISPOSAL

A. Dispose of material and debris from site preparation operations by hauling such materials and debris to an approved off-site disposal area. No rubbish or debris of any kind shall be buried on the site.

B. Burning of cleared and grubbed materials or other fires for any reason will not be permitted.

3.05 PROTECTION

A. Trees and other vegetation designated on the Drawings or directed by the Engineer to remain shall be protected from damage by all construction operations by erecting suitable barriers, guards and enclosures, or by other approved means. The Contractor shall conduct clearing operations in a manner to prevent falling trees from damaging trees and vegetation designated to remain and to the work being constructed. The Contractor shall provide for the safety of employees and others.

B. The Contractor shall maintain protection until all work in the vicinity of the work being protected has been completed.

C. The Contractor shall not operate heavy equipment or stockpile materials within the branch spread of existing trees.

D. The Contractor shall immediately repair any damage to existing tree crowns, trunks, or root systems. Roots exposed and/or damaged during the work shall immediately be cut off cleanly inside the exposed or damaged area. Treat cut surfaces with an acceptable tree wound paint and topsoil spread over the exposed root area.

E. When work is completed the Contractor shall remove all dead and downed trees. Live trees shall be trimmed of all dead and diseased limbs and branches. All cuts shall be cleanly made at their juncture with the trunk or preceding branch without injury to the trunk or remaining branches. Cuts over 1 inch in diameter shall be treated with an acceptable tree wound paint.

F. The Contractor shall restrict construction activities to those areas within the limits of construction designated on the Drawings, within public rights-of-way, and within easements provided by the Owner. Adjacent properties and improvements on these properties, public or private, which become damaged by construction operations shall be promptly restored to their original condition to the full satisfaction of the property owner.

G. The Contractor shall remove trees damaged beyond saving, through no fault of the Contractor, as directed by the Engineer.

END OF SECTION

SECTION 02240
DEWATERING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to complete the dewatering activities. All work in this Section shall be done in accordance with the requirements of the Environmental Resource Permit and Water Use Permit (if required) as issued by the Southwest Florida Water Management District (SWFWMD).

B. In addition to the requirements listed in this Section, the Contractor shall obtain, if required, and comply with all requirements of the Generic Permit for the Discharge of Ground Water From Any Non-Contaminated Site Activity as described in FAC 62-621-300.

C. Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control groundwater flow into excavations and permit construction to proceed on dry, stable subgrades.

1. Maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
2. Prevent surface water from entering excavations by grading, dikes, or other means.
3. Remove dewatering system if no longer needed.

D. The Contractor shall dewater so as to prevent damage to existing work. The Contractor shall repair or replace damage resulting from the dewatering activities promptly, remedy environmental damage as approved by the Engineer, and pay any and all fines levied to the Contractor at no additional cost or time to the Owner.

E. The Dewatering Plan shall be signed and sealed by the licensed professional engineer responsible for its preparation.

F. The Contractor shall design the dewatering system. The Contractor shall be responsible for obtaining whatever investigations are necessary, before bidding, to design the dewatering system.

1.02 SUBMITTALS

The Contractor shall submit the following in accordance with Section 01330, Submittals and Acceptance:

A. Before construction, the Contractor shall obtain a dewatering permit from the SWFWMD as required. At a minimum, the dewatering plan submitted with the dewatering application shall include the following:

1. Duration of dewatering for each area.
2. Number and size of pumps.
3. Method of dewatering each area.
4. Methods for routing/containing the discharge.
5. Methods of isolating dewatering areas.
6. Time dewatering structure will be in place.
7. Proposed discharge points.

Five copies of the plan shall be submitted to the Engineer for record purposes only.

B. The Contractor shall be responsible for determining if a Water Use Permit will be required. If a Water Use Permit is required, it is the Contractor's responsibility to obtain the required information from the Engineer and Owner to complete the Water Use Permit application to submit with the Dewatering Plan. If a Water Use Permit is required, the Contractor shall submit five copies of the application to the Owner/Engineer for submittal purposes only.

C. The Contractor shall be responsible for obtaining a Generic Permit for the Discharge of Produced Ground Water from any Non-Contaminated Site Activity as set forth in FDEP Rule 62-621.300(2), FAC. The Contractor shall obtain the required permit form 62-621.300(2) and the required information from the Engineer and Owner to complete the Generic Permit for the Discharge of Produced Ground Water from any Non-Contaminated Site Activity application to submit with the Dewatering Plan. The Contractor shall submit five copies of the application to the Owner/Engineer for submittal purposes only.

D. Provide photographs or videotape, sufficiently detailed, of existing conditions of adjoining properties, facilities, and other construction and site improvements that might be later misconstrued as damage caused by dewatering operations.

E. Submit Record Drawings at Project closeout identifying and locating utilities and other subsurface structural, electrical, or mechanical items encountered during dewatering.

1. Note locations and capping depth of wells and well points.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Administrative Code (FAC)

1. FAC 62-621-300—FDEP – Generic Permits.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with water disposal requirements of authorities having jurisdiction.

B. Pre-installation Conference: Conduct conference at the Project site to present and discuss dewatering means, methods, and monitoring program.

C. Identify a person who shall be present at all times during the execution of this portion of the Work and who shall be thoroughly familiar with the dewatering system being installed for this Project, the referenced standards, environmental and permit requirements, the requirements of this Work, and who shall direct all work performed under this Section.

D. It shall be the responsibility of the Contractor to determine the water levels before and during the dewatering work.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 QUALIFICATIONS

A. The Contractor shall provide at least one person who shall be present at all times during the execution of this portion of the Work and who shall be thoroughly familiar with the dewatering system being installed, the referenced standards, the requirements of this Work, and who shall direct all work performed under this Section.

B. The Contractor shall be responsible for determining the water level before beginning excavation and construction.

1.08 PRE-BID INSPECTION AND TESTING

A. The Contractor is advised that site soil borings may indicate groundwater levels below the levels which may occur in response to normal, seasonal, extreme, or prolonged rainfall. The Contractor is further advised that site soil borings may not necessarily represent soil conditions to be encountered elsewhere on the job site, other than at the specific boring locations.

B. Before bidding, the Contractor shall perform a detailed site inspection and, if desired, obtain the Owner's permission to perform site-specific testing as he deems necessary to obtain all required information relative to project dewatering requirements.

C. The Contractor shall include as part of his Bid the total cost of all surface and subsurface dewatering as required to construct the Project in complete compliance with the Drawings and these Specifications.

1.09 PROJECT CONDITIONS

A. The Contractor shall not interrupt utilities serving facilities occupied by the Owner or others unless approved by the Owner and Engineer and then only after arranging to provide temporary utility services according to requirements indicated.

B. A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of the geotechnical engineer and represent interpretations of subsoil conditions, tests,

and results of analyses conducted by the geotechnical engineer. The Owner will not be responsible for interpretations or conclusions drawn from these data.

1. The Geotechnical Report is included in an Appendix of these specifications.
2. Make additional test borings and conduct other exploratory operations necessary for dewatering.

C. Survey adjacent structures and improvements, employing a professional land surveyor licensed in Florida to establish exact elevations at fixed points to monitor settlement. Clearly identify monitoring points and reference vertical datum, and benchmarks. Monitor and record existing initial elevations.

1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify the Engineer if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction and existing structures.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 DEWATERING SYSTEM

A. The dewatering system shall be adequate to drain the soils to be excavated to the extent that the piezometric water level in the construction area is a minimum of 2 feet below the bottom of the excavation, side slopes of excavations, or bottom of the footings at all times, or as otherwise required to obtain the specified compaction and installation conditions. Pipeline trenches must be dewatered at least 1 foot below the trench bottom.

B. If layered soils are encountered, the hydrostatic head in the zone below the subgrade elevation shall be relieved to prevent uplift.

C. Unless otherwise noted and before any excavating below or within 2 feet above the groundwater level, a dewatering system shall be placed into operation to lower water levels to the extent specified previously and then shall be operated continuously 24 hours a day, 7 days a week, throughout the excavation to maintain and protect all work until the work has been completed to the satisfaction of the Engineer.

D. Where used, well points shall be installed in an Engineer-approved manner and in sufficient numbers to provide the necessary removal of water as stated previously.

Well points and header piping shall be installed so that traffic on public thoroughfares and site access roads will not be impeded.

E. The Contractor shall be solely responsible for the arrangement, location, and depths of the dewatering system necessary to accomplish the specified work. The dewatering system shall stay in full operation until not less than 90% of the total load is applied, as will be determined by the Engineer, or until excavations and trenches have been backfilled and compacted.

F. To prevent excessive noise, exhaust from all pumps and engines shall be silenced and muffled.

G. Wellpoint or surface water pump discharge shall be controlled to prevent erosion, undermining, and all other damage and be piped to approved locations.

H. With the Engineer's assistance, the Contractor is responsible for determining what approvals and permits are required to comply with any and all applicable regulations and permitting requirements relating to dewatering activities. With the Engineer's assistance the Contractor shall obtain all necessary approvals and permits and comply with any and all applicable regulations and permitting requirements concerning all dewatering activities, including pumpage and discharge. The Contractor is solely responsible for all costs associated with the proper implementation of dewatering activities.

I. The Contractor shall perform all dewatering work in strict compliance with Section 01350, Environmental Protection Procedures, and the Contract Drawings.

J. Excavations shall be kept free from water during the placing of concrete and for 36 hours after or until concrete forms are removed.

K. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.

1. Prevent surface water and subsurface or groundwater from entering excavations, ponding on prepared subgrades, or flooding the site and surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

L. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from the Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

M. Install sufficient dewatering equipment to drain water-bearing strata above and below the bottom of foundations. If excavating through layered soils, relieve any potential groundwater hydrostatic head in the zones below to prevent uplift.

1. Open-sump pumping which leads to loss of fines, subgrade softening, and slope instability shall not be permitted.

N. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water in a manner that avoids flooding or accumulation on private property. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

3.02 OBSERVATION WELLS

A. The Contractor shall install observation wells as may be required to record accurate water levels.

B. The Contractor shall be responsible for maintaining all observation wells and observing and recording the elevation of the piezometric water levels daily.

C. Wells damaged or destroyed shall be replaced at no additional cost to the Owner.

3.03 CLEANUP

A. Upon completing dewatering elsewhere on the Project, the Contractor shall remove all equipment and leave the project site in a neat, clean, and acceptable condition satisfactory to the Owner. Wellpoint holes and excavations shall be adequately backfilled and compacted to prevent settlement.

END OF SECTION

SECTION 02300
EARTHWORK FOR STRUCTURES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, equipment, tools, appliances, and materials and perform all operations necessary for the following:

1. Preparing subgrades for slab-on-grade, walks, pavements, and lawns and grasses.
2. Excavating and backfilling for buildings and structures.
3. Laying the subbase course for concrete sidewalks and pavements.
4. Excavating and backfilling for utility trenches.
5. Excavating and backfilling for trenches for buried mechanical and electrical utilities and pits for buried utility structures, as indicated on the Contract Drawings and described in this Section.

1.02 SUBMITTALS

The Contractor shall submit the following shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D2487 of each onsite and borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D1557 for each onsite and borrow soil material proposed for fill and backfill.

B. The Contractor shall submit records before the start of this work. The Contractor shall verify that the existing conditions are correct as shown on the plans and mentioned in these Specifications. The Contractor shall note any discrepancies found immediately and notify the Owner and Engineer. The records shall include the following:

1. The location of all underground utilities, structures, etc. surrounding the areas to be excavated that may be impacted by the work.
2. The location of test excavations.
3. The location of inspections.

C. Testing Agency Invoices indicating if the invoice is for an initial test or a re-test of the Contractor's work.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM C33/C33M—Standard Specification for Concrete Aggregates.
2. ASTM D698—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).
3. ASTM D1556/D1556M—Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
4. ASTM D1557—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).
5. ASTM D2167—Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
6. ASTM D2487—Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
7. ASTM D2937—Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
8. ASTM D2940/D2940M—Standard Specification for Graded Aggregate Material For Bases or Subbases for Highways or Airports.
9. ASTM D3740—Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
10. ASTM D6938—Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
11. ASTM E329—Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

B. Occupational Safety and Health Administration (OSHA)

1. OSHA 2226—Trenching and Excavation Safety.

1.04 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E329 to conduct soil materials and definition testing, as documented according to ASTM D3740.

B. The Contractor shall do the following:

1. Ensure that excavations provide adequate working space and clearance for the work to be performed and for installing piping and buried utilities. In no case shall excavation faces be undercut.
2. Ensure that foundation surfaces are clean and free of loose material of any kind when pipelines and buried utilities are placed on them.
3. Excavate, trench, and backfill in compliance with applicable requirements of governing authorities having jurisdiction.
4. Ensure that shoring and sheeting for excavations are designed by a Florida-registered Professional Engineer and are in accordance with OSHA 2226.
5. Before beginning any excavation or grading, ensure the accuracy of all survey data indicated on the Contract Drawings and in the Specifications and/or as provided. If the Contractor discovers any inaccuracies, errors, or omissions in the survey data, the Contractor shall immediately notify the Owner so that proper adjustments can be anticipated or ordered. If the Contractor begins any excavation or grading, this shall be considered an acceptance of the survey data by the Contractor, after which time the Contractor has no claim against the Owner resulting from alleged errors, omissions, or inaccuracies of the survey data.
6. Ensure that tolerances for excavation are plus or minus 0.10 foot to the required line and to the required grade. Tolerance for compaction of in-place material shall be plus or minus 0.10 foot to the required grade, unless otherwise noted.
7. Remove unsatisfactory materials and unsuitable materials including muck, silts, peat, and other loose and very loose compressible soils from excavations before placing pipe foundation, bedding, and buried utilities.

1.05 PROJECT CONDITIONS

A. Existing Utilities: The Contractor shall not interrupt utilities serving facilities occupied by the Owner or others unless permitted to do so in writing by the Engineer and then only after arranging to provide temporary utility services according to requirements indicated.

1. Notify the Engineer not less than 2 days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without the Engineer's written permission.
3. Contact a utility-locator service and obtain utility locations for the Project area before excavating.

B. The Contractor shall demolish and completely remove from the site underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

1.06 DEFINITIONS

A. *Backfill*: Soil material or controlled low-strength material used to fill an excavation.

1. *Initial Backfill*: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. *Final Backfill*: Backfill placed over initial backfill to fill a trench.

B. *Base Course*: The course placed between the subbase course and hot-mix asphalt paving.

C. *Bedding Course*: The course placed over the excavated subgrade in a trench before laying pipe.

D. *Borrow Soil*: Suitable soil imported from off site for use as fill or backfill.

E. *Drainage Course*: The course supporting the slab-on-grade that also minimizes the upward capillary flow of pore water.

F. *Excavation*: Removing material encountered above subgrade elevations and to lines and dimensions indicated.

1. *Authorized Additional Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
2. *Unauthorized Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Engineer. Unauthorized excavation as well as remedial work directed by the Engineer shall be without additional compensation.

G. *Fill*: Soil materials used to raise existing grades.

H. *Structures*: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. *Subgrade*: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

J. *Utilities*: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

A. General: The Contractor shall provide borrow soil materials when sufficient suitable soil materials are not available from excavations.

B. Suitable Soils: ASTM D2487 Soil Classification Groups SW and SP or a combination of these groups, free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsuitable Soils: Soil Classification Groups GW, GP, GM, GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or a combination of these groups.

1. Unsuitable soils also include satisfactory soils not maintained within 2% of optimum moisture content at time of compaction.

D. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95% passing a 1-1/2-inch sieve and not more than 8% passing a No. 200 sieve.

E. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90% passing a 1-1/2-inch sieve and not more than 12% passing a No. 200 sieve.

F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; except with 100% passing a 1-inch sieve and not more than 8% passing a No. 200 sieve.

G. Sand: ASTM C33/C33M; fine aggregate, natural, or manufactured sand.

H. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

PART 3 EXECUTION

3.01 PREPARATION

A. The Contractor shall protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. The Contractor shall prepare subgrade for earthwork operations including removing vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface as specified in Section 02230, Site Preparation.

C. The Contractor shall protect and maintain erosion and sedimentation controls, which are specified in Section 01350, Environmental Protection Procedures.

3.02 DEWATERING

A. The Contractor shall prevent surface water and groundwater from entering excavations, from ponding on prepared subgrades, and from flooding the Project site and surrounding area.

B. The Contractor shall protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
2. Install a dewatering system**,** specified in Section 02240, Dewatering, to keep subgrades dry and convey groundwater away from excavations. Maintain until dewatering is no longer required.

3.03 EXPLOSIVES

A. Explosives: Do not use explosives.

3.04 EXCAVATION, GENERAL

A. Unclassified Excavation: The Contractor shall excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered.

Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsuitable soil materials, replace with suitable soil materials.

3.05 EXCAVATION FOR STRUCTURES

A. The Contractor shall excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.10 foot. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb the bottom of the excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 0.10 foot. Do not disturb the bottom of excavations intended as bearing surfaces.

3.06 EXCAVATION FOR WALKS AND PAVEMENTS

A. The Contractor shall excavate surfaces under walks and pavements to indicated lines, cross-sections, elevations, and subgrades.

3.07 SUBGRADE INSPECTION

A. The Contractor shall notify the Engineer when excavations have reached the required subgrade.

B. If the Engineer determines that unsuitable soil is present, the Contractor shall continue excavation and replace with compacted backfill or fill material as directed.

C. The Contractor shall proof-roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll the subgrade in one direction**,** repeating proof-rolling in the direction perpendicular to the first direction. Limit vehicle speed to 3 miles per hour (mph).

2. Excavate soft spots, unsuitable soils, and areas of excessive pumping or rutting, as determined by the Engineer, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices or additional work.

E. As directed by the Engineer, the Contractor shall reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities without additional compensation.

3.08 UNAUTHORIZED EXCAVATION

A. The Contractor shall fill unauthorized excavation under foundations or wall footings by extending the bottom elevation of concrete foundation or footing to the excavation bottom without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2,500 psi, may be used when approved by the Engineer.

1. Fill unauthorized excavations under other construction or utility pipe as directed by the Engineer.

3.09 STORAGE OF SOIL MATERIALS

A. The Contractor shall stockpile excavated suitable soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water.

1. Stockpile soil materials away from edge of excavations. Do not store within the drip line of remaining trees.

3.10 BACKFILL

A. Backfill and compaction shall be according to the recommendations of the Geotechnical Report included as an Appendix to these Specifications.

B. The Contractor shall place and compact backfill in excavations promptly, but not before completing the following:

1. Constructing below finish grade, including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.

6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

C. The Contractor shall place backfill on subgrades free of mud.

3.11 SOIL FILL

A. The Contractor shall plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. The Contractor shall place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use suitable soil material.
2. Under walks and pavements, use suitable soil material.
3. Under building slabs, use engineered fill.
4. Under footings and foundations, use engineered fill.

C. The Contractor shall place soil fill on subgrades free of mud.

3.12 SOIL MOISTURE CONTROL

A. The Contractor shall uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compacting to within 2% of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy.
2. Remove and replace or scarify and air dry otherwise suitable soil material that exceeds optimum moisture content by 2% and is too wet to compact to the specified dry unit weight.

3.13 COMPACTION OF SOIL BACKFILLS AND FILLS

A. The Contractor shall place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. The Contractor shall place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. The Contractor shall compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D698:

1. Under structures, building slabs, steps, and pavements, scarify and recompact the top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95%.
2. Under walkways, scarify and recompact the top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92%.
3. Under lawn or unpaved areas, scarify and recompact the top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90%.
4. For utility trenches, compact each layer of initial and final backfill soil material at 85% in unpaved lawn areas. Final backfill compaction shall meet the requirement listed above depending on the location of the trench.

3.14 GRADING

A. General: The Contractor shall uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross-sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.15 FIELD QUALITY CONTROL

A. The number and location of the tests shall be as specified in these Specifications and as directed by the Engineer during construction.

B. The Contractor shall coordinate activity with the Engineer and the testing agency to permit testing as directed in the presence of the Engineer.

C. The cost of all testing to achieve specified requirements shall be borne by the Contractor. The Contractor shall be reimbursed by the Owner for passing field tests based on the Testing Allowance pay item listed in the Contract Documents.

D. The costs of any and all retests due to failure to achieve specified requirements shall be solely borne by the Contractor and are not reimbursable under this Contract.

E. All materials proposed for use shall be tested as follows:

Material	Required Test	Min No. Tests
Suitable Soil Materials	Soil Classification using ASTM D2487 (including all tests contained therein)	One per source of materials to determine conformance with materials specified herein; additional test whenever there is any apparent change.
	Soil moisture-density relationship using Modified Proctor ASTM D1557	One per source of material or apparent change in material.

F. The Contractor shall allow the testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after the test results for previously completed work comply with requirements.

G. Footing Subgrade: At footing subgrades, the testing agency will perform at least one test of each soil stratum to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Engineer.

H. The testing agency will test compaction of soils in place according to ASTM D1556/D1556M, ASTM D2167, ASTM D2937, and ASTM D6938 as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2,000 square feet or less of paved area or building slab, but in no case fewer than three tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for each 100 feet or less of wall length but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 400 feet or less of trench length but no fewer than two tests.

I. When the testing agency reports that subgrades, fills, or backfills have not achieved the degree of compaction specified, the Contractor shall scarify and moisten or aerate or remove and replace soil to the depth required and recompact and retest until specified compaction is obtained.

J. The approved testing agency shall transmit copies of field testing results as follows:

1. One copy to the Owner.
2. Two copies to the Engineer.
3. Two copies to the Contractor.

The field test reports shall include, at a minimum, project title; project location; location of sample(s) tested; time of testing; date of testing; testing person's full name; testing agency name, address, and telephone number; and test results.

K. No soil material shall be used until (1) the Engineer has reviewed and approved test reports and (2) the Contractor submits certification that the soil material proposed for construction is clean and meets gradation and other parameters specified in this Specification.

L. At no cost to the Owner, the Contractor shall remove and replace or correct all materials and work which tests indicate do not conform, in the opinion of the Engineer, to the requirements of these Specifications.

M. The results of in-place density tests shall be considered satisfactory if the density in each instance is equal to or greater than the specified density. Soil moisture content at the time of testing shall conform to requirements of these Specifications.

N. Where unsatisfactory compaction is revealed by the tests, the Contractor shall re-excavate, backfill, recompact, and/or rework the backfill as required to obtain the required degree of compaction over the entire depth of the excavation.

O. The testing agency shall transmit to the Engineer copies of all testing agency invoices submitted to the Contractor for payment. Invoices shall clearly indicate specific services and date and time services are rendered and shall indicate if the invoiced testing cost is an initial test of the Contractor's work or is a re-test required due to the Contractor's failure to initially achieve the specified requirements.

3.16 PROTECTION

A. Protecting Graded Areas: The Contractor shall protect newly graded areas from traffic and erosion and keep them free of trash and debris.

B. The Contractor shall repair and reestablish grades to the specified tolerances where completed or partially completed surfaces become eroded, rutted, settled,

or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by the Engineer and reshape and recompact.

C. Where settling occurs before the Project Correction Period elapses, The Contractor shall remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: The Contractor shall transport surplus suitable soil to designated storage areas on the Owner's property and stockpile and spread this soil as directed by the Engineer.

1. Remove waste material, including unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.

END OF SECTION

SECTION 02305
EARTHWORK FOR UTILITIES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall provide all materials, equipment, labor, and work necessary to completely construct the project in accordance with the Contract Documents. This work includes but is not limited to the following:

1. Backfilling trenches at the end of each working day or placement of steel plates over trenches after working hours. Steel plates shall be H-20 load rated.
2. Preparing trench foundations.
3. Providing suitable material for all trenches as specified and as required.
4. Obtaining, storing, maintaining, and disposing of materials.
5. Dewatering, shoring, and sheeting.
6. Placing, compacting, testing, final grading, and subgrade demolition.
7. Performing all other work required by the Contract Documents.

B. The Contractor is responsible for performing all work so as not to damage existing roadways, facilities, utilities, structures, etc. and shall repair and replace such damage to equal or better than its original undamaged condition without cost to the Owner.

C. The Contractor shall examine the site before submitting a bid, taking into consideration all conditions that may affect the work.

D. The Contractor shall coordinate all additional subsurface investigations and testing included with this work with the Engineer before performing the excavation and foundation preparation work. In general, if the Contractor finds different and unsuitable/unsatisfactory soil conditions during the work, the Contractor shall notify the Engineer and the Owner immediately.

1.02 SUBMITTALS

The Contractor shall submit the following shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D2487 of each onsite and borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D1557 for each onsite and borrow soil material proposed for fill and backfill.

B. The Contractor shall submit records before the start of this work. The Contractor shall verify that the existing conditions are correct as shown on the plans and mentioned in these Specifications. The Contractor shall note any discrepancies found immediately and notify the Owner and Engineer. The records shall include the following:

1. Location of all existing underground utilities, structures, etc. surrounding the areas to be excavated that may be impacted by the work.
2. Location of test excavations.
3. Location of inspections.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply:

A. American Society for Testing and Materials (ASTM)

1. ASTM D1556/D1556M—Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
2. ASTM D1557—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
3. ASTM D2487—Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
4. ASTM D2937—Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
5. ASTM D3282—Standard Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.

6. ASTM D3740—Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used In Engineering Design and Construction.
7. ASTM D6938—Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
8. ASTM E329—Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

B. Florida Statutes (FL)

1. Florida Trench Safety Act (90-96, Laws of Florida).

C. Occupational Safety and Health Administration (OSHA)

1. 29 CFR 1926, Subpart P—Safety and Health Regulations for Construction, Excavations.
2. OSHA 2226—Trenching and Excavation Safety.

1.04 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E329 to conduct soil materials and definition testing, as documented according to ASTM D3740.

B. The Contractor shall do the following:

1. Ensure that excavations provide adequate working space and clearance for the work to be performed and for installing piping and buried utilities. In no case shall excavation faces be undercut.
2. Ensure that foundation surfaces are clean and free of loose material of any kind when pipelines and buried utilities are placed on them.
3. Perform excavating, trenching, and backfilling in compliance with applicable requirements of governing authorities having jurisdiction.
4. Ensure that shoring and sheeting for excavations are designed by a Florida-registered Professional Engineer and are in accordance with the OSHA 2226.
5. Before beginning any excavation or grading, ensure the accuracy of all survey data indicated on the Contract Drawings and in these Specifications and/or as provided. If the Contractor discovers any inaccuracies, errors, or omissions in the survey data, the Contractor shall immediately notify the Owner so that proper adjustments can be anticipated or ordered. If the Contractor begins any excavation or grading, this shall be considered an acceptance of the survey data by the Contractor, after which time the

Contractor has no claim against the Owner resulting from alleged errors, omissions, or inaccuracies of the survey data.

6. Ensure that tolerances for excavation are ±0.10 foot to the required line and to the required grade. Tolerance for compaction of in-place material shall be ±0.10 foot to the required grade.
7. Ensure that all trench materials derived from the project site and imported to this site are examined, tested, and classified by an Engineer-approved soils testing laboratory.
8. Remove unsuitable materials and unsuitable materials including muck, silts, peat, and other loose and very loose compressible soils from excavations before placing pipe foundation, bedding, and buried utilities.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 PROJECT CONDITIONS

A. Existing Utilities: The Contractor shall not interrupt utilities serving facilities occupied by the Owner or others unless permitted to do so in writing by the Engineer and then only after arranging to provide temporary utility services according to the requirements indicated.

1. Notify the Engineer not less than 2 days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without the Engineer’s written permission.
3. Contact a utility-locator service and obtain utility locations for the Project Area before excavating.

B. The Contractor shall demolish and completely remove from the site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

1.08 DEFINITIONS

A. *Backfill*: Soil material or controlled low-strength material used to fill an excavation.

1. *Initial Backfill*: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. *Final Backfill*: Backfill placed over initial backfill to fill a trench.

B. *Base Course*: The course placed between the subbase course and hot-mix asphalt paving.

C. *Bedding Course*: The course placed over the excavated subgrade in a trench before laying pipe.

D. *Borrow Soil*: Suitable soil imported from off site for use as fill or backfill.

E. *Drainage Course*: The course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. *Excavation*: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. *Authorized Additional Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Engineer. Authorized additional excavation and replacement material will be paid for according to the Contract provisions for unit prices.
2. *Bulk Excavation*: Excavation more than 10 feet in width and more than 30 feet in length.
3. *Unauthorized Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be without additional compensation.

G. *Fill*: Soil materials used to raise existing grades.

H. *Structures*: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. *Subgrade*: The surface or elevation remaining after completing excavation, or the top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

J. *Utilities*: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.09 TESTING REQUIREMENTS

A. The Contractor shall furnish a soil survey for suitable material and samples of materials.

B. Testing for source material, for classification, and for prequalification of material (on or off site) shall be performed by an independent testing agency retained by the Contractor and approved by the Engineer.

C. Testing for in-place compacted fill shall be performed by the same independent testing agency as approved by the Engineer and retained by the Contractor.

D. The number and location of the tests shall be as specified in these Specifications and as directed by the Engineer during construction.

E. The Contractor shall coordinate activity with the Engineer and the testing agency to permit testing as directed in the presence of the Engineer.

F. The cost of all testing to achieve specified requirements shall be borne by the Contractor. The Contractor shall be reimbursed by the Owner for passing field tests.

G. The costs of any and all retests due to failure to achieve specified requirements shall be solely borne by the Contractor and are not reimbursable under this contract.

H. All materials proposed for use shall be tested as follows:

Material	Required Test	Min. No. Tests
Suitable Soil Materials	Soil Classification using ASTM D2487 (including all tests contained therein)	One per source of materials to determine conformance with materials specified this Specification; additional test whenever there is any apparent change.
	Soil moisture-density relationship using Modified Proctor ASTM D1557	One per source of material or apparent change in material.

I. Soil materials shall be tested during construction as follows:

Material	Required Test	Min. No. Tests
Suitable Soil Material in-place after compaction	Field Density ASTM D1556/1556M – Sand Cone Method, or ASTM D6938 – Nuclear Density Method, or ASTM D2937 – Drive Cylinder Method	For each layer of trench bottom subgrade before addition of soil materials, refill, bedding, and backfill, and for each 400 lineal feet of trench or fraction thereof, whichever is greater; two tests for each drainage, manhole, or wet well structure; additional test whenever there is any change in native soil, groundwater, or soil moisture conditions.

J. The approved testing agency shall transmit copies of required laboratory test results as follows:

1. One copy to the Owner.
2. Two copies to the Engineer.
3. Two copies to the Contractor.

The laboratory test reports shall include, at a minimum, project title; project location; location of sample; source, time, and date of testing; testing agency's name, address, and telephone number; and test results. Each test report shall be signed and sealed by the Professional Engineer representing the testing agency as specified in these Specifications.

K. The approved testing agency shall transmit copies of field testing results as follows:

1. One copy to the Owner.
2. Two copies to the Engineer.
3. Two copies to the Contractor.

The field test reports shall include, at a minimum, project title; project location; location of sample(s) tested; time of testing; date of testing; testing person's full name; testing agency name, address, and telephone number; and test results.

L. No soil material shall be used until 1) the Engineer has reviewed and approved test reports and 2) the Contractor submits certification that the soil material proposed for construction is clean and meets gradation and other parameters in these Specifications.

M. At no cost to the Owner, the Contractor shall remove and replace or correct all materials and work which tests indicate do not conform, in the opinion of the Engineer, to the requirements of these Specifications.

N. The results of in-place density tests shall be considered satisfactory if the density in each instance is equal to or greater than the specified density. Soil moisture content at the time of testing shall conform to requirements of these Specifications.

O. Where the tests reveal unsatisfactory compaction, the Contractor shall re-excavate, backfill, recompact, and/or rework the backfill as required to obtain the required degree of compaction over the entire depth of the excavation.

P. The testing agency shall transmit to the Engineer copies of all testing agency invoices submitted to the Contractor for payment. Invoices shall clearly indicate specific services and date and time services are rendered and shall indicate if the invoiced testing cost is an initial test of the Contractor's work or is a re-test required due to the Contractor's failure to initially achieve the specified requirements.

PART 2 PRODUCTS

2.01 STRUCTURAL MATERIALS

A. Materials used for shoring and bracing, such as sheet piling, uprights, stringers, and crossbraces, shall be in good serviceable condition. Any timber used shall be sound and free from large or loose knots.

B. Pressure-treated timber shall be used where wood sheeting or piling is specified or indicated to be cut and left in place.

2.02 TRENCH SOIL MATERIALS

A. Materials used for trench construction shall be free of clumps of clay, rock or gravel, debris, waste, frozen materials, and other deleterious matter as determined by the Engineer and shall be suitable soil materials as follows:

Area Classification	Soil Materials
In excavations and trenches	Excavated and borrow material that has been sampled, tested, and approved as "Suitable Soil Material."

B. Suitable Soil Materials

1. Soil Classification Groups: Suitable soil materials for each trench shall be as follows:

Suitable Soil Material (ASTM D487, Soil Classification Groups)		
In-situ Foundation	Bedding, Haunching, and Initial Backfill	Final Backfill
SW SP	SW SP	SW SP

2. Maximum Particle Size Limitations for Suitable Soil Materials: The maximum allowable particle size for suitable soil materials within each trench for each type of utility shall be as follows:

Conduit	Maximum Allowable Particle Size		
	In-situ Foundation	Bedding, Haunching, and Initial Backfill	Final Backfill
Plastic Pipe (PVC, CPVC, HDPE, etc.) less than 6-inch-diameter	See Note 1	1/2 inch	3 inches
Plastic Pipe (PVC, CPVC, HDPE, etc.) 6-inch-diameter and Larger	See Note 1	3/4 inch	3 inches
Concrete Pipe			
Steel Pipe			
Ductile Iron Pipe			
Fiberglass Pipe	See Note 1	3/4 inch or three times the wall thickness, whichever is less	3 inches
Other Conduit Materials	See Note 2	See Note 2	See Note 2

(1) There is no requirement when suitable undisturbed native soil material is used. Disturbed portions of the foundation and/or unsuitable native soil material shall be replaced with suitable soil materials meeting all the requirements for Bedding.
(2) The maximum allowable particle size shall be in accordance with the manufacturer's written recommendation.

3. Additional Requirements of Suitable Materials: Suitable soil materials shall be free of debris, waste, frozen materials, vegetation, or other deleterious matter. Soils within 4 inches of the exterior surface of the pipe shall be free of gravel, stones, or other materials which may abrade the pipe surface.

C. Unsuitable Materials

1. Unsuitable soil material shall mean ASTM D2487, Soil Classification Groups GW, GP, GM, GC, SC, CL, ML, OL, CH, MH, OH, PT, and other

highly organic soils and soil materials of any classification that have a moisture content at the time of compaction beyond the range of 1 percentage point below and 3 percentage points above the optimum moisture content of the soil material as determined by moisture-density relations test.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

The Contractor shall do the following:

A. Carefully verify by hand methods the location of all surrounding underground utilities before performing utility excavations and trenches.

B. Protect utilities to be left in place from damage.

C. Do not interrupt existing utilities serving facilities occupied and used by the Owner, except when permitted in writing by the Owner.

D. Protect benchmarks, survey points, and existing structures, roads, sidewalks, monitoring wells, paving, curbs, etc. against damage from equipment, vehicular or foot traffic, settlement, lateral movement, undermining, washout, and all construction-related activities.

E. Repair and replace damage to existing facilities to equal or better than their original undamaged condition without cost to the Owner and to the approval of the Engineer.

F. Excavate and trench in ways that will prevent surface water and subsurface water from flowing into excavations and will also prevent flooding of the site and surrounding area.

G. Protect excavations and trenching by shoring, bracing, sheet piling, underpinning, or other methods as required to prevent cave-ins or loose dirt from falling into excavations and trenches.

H. Do not operate earth-moving equipment within 5 feet of walls of concrete structures for depositing or compacting backfill material.

I. Compact the backfill material placed next to concrete walls with hand-operated tampers or similar equipment that will not damage the structure.

J. Excavate, fill, backfill, and grade to elevations required by the Contract Documents.

K. Pile excavated materials suitable for backfill in an orderly manner a sufficient distance from excavations to prevent overloading, slides, and cave-ins.

L. Do not obstruct access ways, roadways, and plant facilities.

M. Dewater excavations and trenches in accordance with Section 02240, Dewatering.

N. Refer to the Contract Drawings for additional requirements related to earthwork and protection of existing features.

3.02 TRENCH EXCAVATION

A. Before excavating the trench, the Contractor shall prepare the surface, including clearing and grubbing as specified in Section 02230, Site Preparation.

B. The Contractor shall be required to fully comply with all applicable OSHA Excavation Safety Standards and to abide by them as covered by the most current version of the Florida Trench Safety Act (90-96, Laws of Florida).

C. The Contractor shall ensure that mechanical equipment used for trench excavation shall be of a type, design, and construction and shall be so operated that conduit/ utility, when accurately laid to specified alignment, will be centered in the trench with adequate clearance between the conduit/utility and sidewalls of the trench. Undercutting the trench sidewall to obtain clearance will not be permitted.

D. The Contractor shall not use mechanical equipment in locations where its operation would cause damage to trees, buildings, culverts, other existing property, utilities, structures, etc. above or below ground. In all such locations, the Contractor shall use hand excavating methods.

E. The Contractor shall not use blasting.

F. The Contractor shall cut trenches sufficiently wide to enable proper installation of services and to allow for testing and inspection. The Contractor shall also trim and shape trench bottoms and leave them free of irregularities, lumps, and projections. Trench width shall be excavated as specified on the Contract Drawings.

G. The Contractor shall construct trench walls so as to avoid side wall collapse or sloughing. Trenches shall be either braced or open construction in accordance with the Contract Documents. No separate payment will be made for any special procedure used in connection with the excavation.

H. Where sheeting and bracing are not required, the Contractor shall construct trench walls in the bottom of the excavation as vertical as possible to the maximum height allowable by OSHA. Trench walls above this height shall be sloped to guard against side wall collapse or sloughing as specified on the Contract Drawings.

I. Where sheeting and bracing are required, the sheeting and bracing system shall meet the requirements specified in these Specifications.

J. Excavations shall be to the design elevations shown on the Contract Drawings or as specified, unless unsatisfactory or unsuitable foundation materials are encountered in the bottom of the excavation. Where unsatisfactory or unsuitable foundation materials are encountered, this material shall be undercut and removed as indicated on the Contract Drawings and replaced with suitable soil material meeting all the requirements for Bedding. The lift thicknesses and compaction requirements for the replacement soil shall also meet the requirements for Bedding.

K. The Contractor shall be careful not to overexcavate except where necessary to remove unsatisfactory or unsuitable materials, irregularities, lumps, rock, and projections. Unnecessary overexcavation shall be replaced as specified in these Specifications at the Contractor's sole expense.

L. The Contractor shall accurately grade bedding soil materials at the bottoms of the trenches to provide uniform bearing and support for each section of conduit/utility at every point along its entire length except where it is necessary to excavate the bedding for conduit/utility bells (e.g., pipe bells), etc. or for proper sealing of conduit/utility joints. Abrupt changes in grade of the trench bottom shall be avoided.

M. The Contractor shall dig bell holes and depressions after the bedding has been graded to ensure that the conduit/utility rests on the prepared bedding for as much of its full length as practicable. Bell holes and depressions shall be only of such length, depth, and width as required to make the joint.

N. The Contractor shall do the following:

1. Pile all excavated material in a manner that will not endanger the work or erode the stormwater management facilities or water courses.
2. Avoid obstructing sidewalks, driveways, and plant facilities.
3. Leave hydrants, valve pit covers, valve boxes, or other utility controls unobstructed and accessible.

4. Keep gutters, drainage inlets, natural water courses, and miscellaneous drainage structures clear or make other satisfactory provisions for their proper operation.

O. The Contractor shall keep all suitable materials that are suitable for use/reuse in the trench construction separated from unsuitable materials.

P. Except where otherwise authorized, indicated, or specified, the Contractor shall replace, at the Contractor's own expense, all materials excavated below the bottom of concrete walls, footings, slabs on grade, and foundations with concrete or flowable fill, as directed by the Engineer.

Q. The Contractor shall adhere to these Additional Excavation Requirements for piping:

1. Excavate trenches so that the piping can be laid to the lines, grades, and elevations indicated on the Contract Drawings.

2. For piping designated to be laid to a minimum cover requirement, grade trenches to avoid high and low points to the extent practical. Record Drawings of such pipes shall present top-of-pipe and grade elevations at all high and low points along each pipe segment, at the end points of each pipe segments, and at intervals not to exceed 100 feet along each pipe segment. If, in the opinion of the Engineer, additional air release and/or vacuum relief valves are required, the Contractor shall install the additional items as directed by the Engineer.

3. Except at locations specifically indicated otherwise on the Contract Drawings, the required minimum cover over the top of the pipe from finished grade for various pipe diameters shall be as follows:

	Pipe Diameter			
	48 inch or less	66 inch	72 inch	96 inch
Minimum Cover	3 feet	4 feet	4.5 feet	5 feet

Continue dewatering operations along each pipe segment until the required minimum cover is provided. During the dewatering operations, the groundwater level in the trench shall remain at all times a minimum of 1 foot below bottom of trench excavations.

R. The Contractor shall adhere to these Additional Excavation Requirements for Electrical Utilities:

1. Avoid abrupt changes in grade of the trench bottom.

2. The required minimum cover over the top of electrical conduits from finished grade shall be as follows:

	Electrical Conduits (Lines less than 5 kV)	Electrical Conduits (Lines 5 kV and up)
Minimum Cover	2 feet	3 feet

3. The required minimum clearance from the bottom of mat foundations and/or footings shall be 2 feet. Provide additional cover where necessary to satisfy the minimum clearance requirement.

4. Provide additional cover depth if necessary to avoid interference of other cables, ducts, piping, structures, and other utilities.

S. The Contractor shall adhere to this Additional Excavation Requirement for Appurtenances:

1. Ensure that excavations for valves and similar appurtenances shall be sufficient to leave at least 12 inches in the clear between the outer surfaces and the embankment or timber used to hold and protect the walls.

3.03 PROTECTION OF PERSONS AND PROPERTY

A. The Contractor shall do the following:

1. Barricade and post excavations with warning signs for the safety of persons. Provide warning lights during hours of darkness.
2. Protect structures, utilities, sidewalks, pavements, and other facilities immediately adjacent to excavations against damage, including loading, settlement, lateral movement, undermining, and washout.

B. Conduct topsoil removal operations to ensure the safety of persons and to prevent damage to existing structures and utilities, construction in progress, trees and vegetation to remain standing, and other property.

3.04 SHEETING AND BRACING

A. Where sheeting and bracing are required to support the side walls of the excavation, the Contractor shall retain a Professional Engineer, registered in Florida, to design sheeting and bracing. The design shall establish requirements for sheeting and bracing and shall comply with all applicable codes; authorities having jurisdiction; and federal, state, and local regulations.

B. The sole responsibility for the design, methods of installation, and adequacy of sheeting and bracing shall be and shall remain that of the Contractor and the Contractor's Professional Engineer. The Contractor shall provide all necessary sheeting and bracing or other procedures as required to ensure safe working conditions and to protect the excavations.

C. Sheeting and bracing shall consist of braced steel sheet piling, trench box, braced wood lagging, and soldier beams or other approved methods.

D. The Contractor shall immediately fill and compact voids formed outside the sheeting. Where soil cannot be properly compacted to fill the void, the Contractor shall use Class B concrete as backfill at no additional cost to the Owner.

E. The Contractor shall install sheeting outside the required clearances and dimensions. Sheeting shall be plumb, securely braced, and tied in position. Sheeting shall be adequate to withstand all pressure to which it may be subjected. The Contractor shall correct any movement or bulging at no expense to the Owner so as to provide the necessary clearances and dimensions.

F. The Contractor shall maintain sheeting and bracing in excavations and trenches for the entire time excavations will be open.

G. The Contractor shall not brace sheeting against pipe being laid. Sheeting shall be braced so that no concentrated load of horizontal thrust is transmitted to the pipe.

3.05 DEWATERING, WATER REMOVAL, AND DRAINAGE MAINTENANCE

A. Water shall not be permitted to accumulate in excavations. The Contractor shall provide dewatering systems to convey water away from excavations so that softening of foundations bottoms, footing undercutting, and soil changes detrimental to subgrade stability and foundation will not occur. Dewatering systems and methods of disposal shall be as specified in Section 02240, Dewatering, and as approved by the Engineer before being installed by the Contractor. Groundwater levels shall be maintained a minimum of 1 foot below bottom of trenches or excavations.

B. Dewatering systems and equipment shall be in place as required to eliminate water during the excavation period until the work is completed. The Contractor shall provide ample means and equipment with which to remove promptly and dispose of properly all water entering any excavation. This includes the use of sand or gravel as required to maintain adequate flow during the pipe laying or installation of other items of work within the excavation.

C. The Contractor shall dispose of water pumped or drained in a suitable manner without damage to adjacent property, to other work under construction, or to roads. Water shall not be discharged onto surface improvements without adequate protection of the surface at the point of discharge. All gutter, drains, culverts, sewers, and inlets shall be kept clean and open for surface drainage. Water shall not be directed across or over pavements except through approved pipes or properly constructed troughs. The Contractor shall obtain permission from the Owner of any property involved before constructing water courses or installing discharge pipe or hose for removal of water and provide for disposal of the water without ponding or creating a public nuisance.

D. All pumps used for dewatering shall have noise-reduction features and shall be able to run continuously with minimal attendance. If required by the Owner or Engineer, the pumps shall be enclosed on all sides with a plywood enclosure with padded material suitable for outdoor conditions on the inside of the enclosure to further reduce pump engine noise to an acceptable level. All applicable ordinances and codes for noise abatement shall be followed. The Contractor shall maintain pumps at all times, as necessary. When pumps are no longer required, the Contractor shall remove the pumps, wellpoints, pipes, and other apparatus from the area.

E. It is essential that the discharge of the trench dewatering pumps be conducted to natural drainage channels, drains, or storm sewers.

F. Trenches shall be constructed on the upstream side of the traffic way across roadways, driveways, or other traffic ways adjacent to drainage ditches or water to prevent impounding water after the pipe has been laid. The Contractor shall construct and maintain bridges and other temporary structures required to maintain traffic across such unfilled trenches. Backfilling shall be done so that water will not accumulate in unfilled or partially filled trenches. After backfilling is completed, the Contractor shall immediately remove all material deposited in roadway ditches or other water courses crossed by the line of trench and restore the original section, grades, and contours of ditches or water courses. Surface drainage shall not be obstructed longer than necessary.

G. Where trenches are constructed in ditches or other water courses, backfill shall be protected from surface erosion. Where the grade of the ditch exceeds 1%, the Contractor shall install ditch checks. Unless otherwise indicated on the Contract Drawings, ditch checks shall be concrete or as otherwise approved by the Engineer. Ditch checks shall extend not less than 2 feet below the original ditch or water course bottom for the full bottom width and at least 18 inches into the side slopes and shall be at least 12 inches thick.

3.06 BACKFILLING AND COMPACTION

A. Backfill and compaction shall be according to the recommendations of the Geotechnical Report provided as an Appendix to these Specifications.

B. The Contractor shall not backfill trenches until required tests are performed.

C. Trenches improperly backfilled shall be reopened to the depth required for proper compaction, then refilled and compacted as specified, or the condition shall be otherwise corrected as directed.

D. The Contractor shall perform the following steps to ensure compaction at the bottom of the trench or excavation before bedding:

1. Remove disturbed native soil material and/or any soils not meeting the requirement of suitable soil material as indicated on the Contract Drawings.
2. Compact the bottom of the trench excavation (undisturbed native subsurface soil) to no less than 95% of the Modified Proctor maximum dry density in accordance with ASTM D1557, before placement of foundation, bedding, piping, and backfill.

E. To backfill below and around pipe to the spring line of the pipe, the Contractor shall do the following:

1. Construct foundation and bedding as indicated on the Contract Drawings before placement of pipe.
2. Install each pipe at proper grade, alignment, and final position.
3. Deposit suitable soil material uniformly and simultaneously on each side of pipe in completed course layers to prevent lateral displacement.
4. Compact under pipe haunches and on each side of pipe to the pipe spring line as shown on the Contract Drawings to hold the pipe in the proper position during subsequent pipe backfilling and compaction operations.
5. Construct haunching as indicated on the Contract Drawings.

F. To trench backfill above pipe spring line to finished grade, the Contractor shall do the following:

1. Deposit suitable soil material around and above pipe in uniform layers as shown on the Contract Drawings.
2. Backfill and compact trenches from the spring line of the pipe to the top of the trench in completed course layers as shown on the Contract Drawings.

3. Use material previously defined in these Specifications as suitable soil material.
4. Compact by hand or mechanical tampers.

3.07 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. The Contractor shall remove and legally dispose of waste materials, including excavated material classified as unsuitable soil material, trash, and debris from the property at no additional cost to the Owner.

END OF SECTION

SECTION 02370
EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall take every reasonable precaution throughout construction to prevent the erosion of soil and the sedimentation of streams, bays, storm systems, or other water impoundments, ground surfaces, or other property as required by federal, state, and local regulations.

B. The Contractor shall provide protective covering for disturbed areas upon suspension or completion of land-disturbing activities. Permanent vegetation shall be established at the earliest practicable time. Temporary and permanent erosion-control measures shall be coordinated to ensure economical, effective, and continuous erosion and siltation control throughout the construction and post-construction period.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Department of Transportation (FDOT)

1. FDOT Section 103—Temporary Work Structures.
2. FDOT Section 104—Prevention, Control, and Abatement of Erosion and Water Pollution.
3. FDOT Section 530—Revetment Systems.
4. FDOT Section 982—Fertilizer.
5. FDOT Section 985—Geosynthetic Materials.

1.04 REGULATORY REQUIREMENTS

A. The Contractor shall prevent damage to properties outside the construction limits from siltation due to construction of the project and assume all responsibilities to the affected property owners for correction of damages which may occur. Erosion-control measures shall be performed conforming to the requirements of and in accordance with plans approved by applicable state and local agencies and as specified by the erosion-control portion shown on the Drawings and as required by these Specifications. The Contractor shall not allow mud and debris to accumulate in the streets or enter drainage ditches, canals, or waterways. Should the Contractor pump water from excavations during construction, appropriate siltation preventative measures shall be taken before the pumped water is discharged into any drainage ditch, canal, or waterway.

1.05 PRACTICES

The Contractor shall adhere to the following:

A. Avoid dumping soil or sediment into any stream bed, pond, ditch, or watercourse.

B. Maintain an undisturbed vegetative buffer where possible between a natural watercourse and trenching and grading operations.

C. Avoid equipment crossings of streams, creeks, and ditches where practicable.

1.06 EROSION AND SEDIMENT-CONTROL DEVICES AND FEATURES

A. The Contractor shall construct all devices (silt fences, retention areas, etc.) for sediment control at the locations required to protect federal, state, and local water bodies and water courses and drainage systems before beginning to excavate the site. All devices shall be properly maintained in place until a structure or paving makes the device unnecessary or until directed to permanently remove the device.

B. The Contractor shall use mulch to temporarily stabilize areas subject to excessive erosion and to protect seed beds after planting where required.

C. Filter fabric, hay bales, or other approved methods shall be placed and secured over the grates of each existing inlet, grating, or storm pipe opening near the area of excavation to prevent silt and debris from entering the storm systems.

D. The Contractor shall use silt fences, hay bales, and floating turbidity barriers as shown on the plans or as directed by the Owner or Owner’s Representative to restrict movement of sediment from the site.

E. The Contractor shall establish vegetative cover on all unpaved areas disturbed by the work.

PART 2 PRODUCTS

2.01 GENERAL

A. Open-mesh biodegradable mulching cloth.

B. Fertilizer shall be 10-10-10 grade or equivalent.

C. Lime shall be Dolomitic Agricultural Ground limestone, in accordance with FDOT Section 982.

D. Grass shall be in accordance with Section 02920, Seeding and Sodding.

E. Silt fence shall consist of non-biodegradable filter fabric (Trevira, Mirafi, etc.), in accordance with FDOT Section 985, wired to galvanized wire mesh fencing and supported by wood or metal posts.

F. Floating or staked turbidity barriers as specified in FDOT Section 985 and FDOT Section 104.

G. Erosion Stone: FDOT Section 530.

1. Sand-Cement Riprap.
2. Concrete Block.
3. Rubble 20 to 300 pounds each.

H. Filter Fabric for placing under Riprap shall meet the requirements of FDOT Section 985.

I. Baled hay or straw in accordance with FDOT Section 104.

PART 3 EXECUTION

3.01 CLEARING

A. The Contractor shall schedule and perform clearing and grubbing so that subsequent grading operation and erosion-control practices can follow immediately after. Excavation, borrow, and embankment operations will be conducted as a continuous operation. All construction areas not otherwise protected shall be planted with permanent vegetative cover within 30 working days after completing active construction.

3.02 STABILIZING

A. The angle for graded slopes and fills shall be no greater than the angle that can be retained by vegetative cover or other adequate erosion-control devices or structures. All disturbed areas outside of embankment left exposed will, within 30 working days of completion of any phase of grading, be planted or otherwise provided with either temporary or permanent ground cover, devices, or structures sufficient to restrain erosion.

3.03 REGULATORY REQUIREMENTS

A. Whenever land-disturbing activity is undertaken on a tract, a ground cover sufficient to restrain erosion must be planted or otherwise provided within 30 working days on that portion of the tract upon which further active construction is to be undertaken.

B. If any earthwork is to be suspended for any reason for longer than 30 calendar days, the areas involved shall be seeded with vegetative cover or otherwise protected against excessive erosion during the suspension period. Suspension of work in any area of operation does not relieve the Contractor of the responsibility to control erosion in that area.

3.04 VEGETATIVE COVER

A. Preparation of Seedbed. Areas to be seeded shall be scarified a depth of 4 inches until a firm, well-pulverized, uniform seedbed is prepared. Fertilizer shall be applied during the scarification process in accordance with the following rates:

1. Fertilizer—10 to 15 pounds per 1,000 square feet.

B. Seeding. Disturbed areas along embankments shall be permanently seeded with mix specified in Section 02920, Seeding and Sodding.

C. The Contractor shall mulch all areas immediately after seeding. Mulch shall be applied and anchored as specified previously in this Section.

3.05 MAINTENANCE

A. The Contractor shall maintain all temporary and permanent erosion-control measures in functioning order. Temporary structures shall be maintained until such time as vegetation is firmly established and grassed areas shall be maintained until completion of the project. Areas which fail to show a suitable stand of grass or which are damaged by erosion shall be immediately repaired. No additional

payment will be made to the Contractor for re-establishing erosion-control devices, which may become damaged, destroyed, or otherwise rendered unsuitable for their intended function during the construction of the project.

B. The Contractor shall remove all silt, sediment, and debris buildup regularly to maintain functioning storm systems and erosion-control devices.

3.06 REMOVAL OF SEDIMENT CONTROL DEVICES

A. Near completion of the project, when directed by the Engineer, the Contractor shall dismantle and remove the temporary devices used for sediment control during construction. All erosion-control devices in seeded areas shall be left in place until the grass is established. The Contractor shall seed areas around devices and mulch after removing or filling temporary control devices.

B. The Contractor shall clean up all areas at the completion of the project.

END OF SECTION

SECTION 02700
EARTHWORK, PAVING, AND MARKINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to provide for the construction of all pavement and work related to roadways where indicated on the Drawings.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Limerock material submittal is to be made to include liquid limit, plastic index, gradation, certification regarding deleterious material, limerock bearing ratio (LBR), Florida Department of Transportation (FDOT) pit number, and other information as required to indicate performance in accordance with the specifications.

B. Information regarding asphaltic concrete materials and mix shall be submitted as required by the referenced FDOT specifications.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time, unless otherwise noted. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section.

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this Contract.
2. The Contractor shall retain an independent testing agency, as approved by the Engineer, to perform all tests, including tests referenced to be performed by the Engineer.
3. Payment for this project is in accordance with the Bid Form.

B. American Society of Testing and Materials (ASTM)

1. ASTM D1556/D1556M—Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
2. ASTM D1557—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).
3. ASTM D2167—Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
4. ASTM D6938—Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.04 QUALITY ASSURANCE

A. The Contractor shall perform field-density tests along the centerline of construction or as directed by the Engineer and in accordance with the FDOT's *Standard Specifications for Road and Bridge Construction*, latest edition, FDOT Standard.

B. The Contractor shall field check the depth of stabilization and/or limerock at each road crossing with a pipeline.

C. The Engineer may require additional testing as deemed necessary. The Engineer shall interpret test results and the Contractor shall perform remedial work as directed by the Engineer. The Contractor shall provide labor to the Engineer for help in performing tests and/or checking line and grade at no additional cost to the Owner.

D. Laboratory maximum dry density of soil mixtures at optimum moisture shall be determined by ASTM D1557 for subgrade, stabilized subgrade, and limerock base course.

E. Field density of stabilized subgrade and soils or soil mixtures in fill or backfill shall be determined by ASTM D1556/D1556M, D2167, or D6938 for limerock base course.

F. Bearing value of stabilized subgrade shall be determined by the methods required for determining limerock bearing ratio (LBR) according to the FDOT, Standard Specification FM 5-515.

G. Field density of stabilized subbase shall be 98% or greater of the Modified Proctor maximum dry density, ASTM D1557.

H. Field density of limerock base course shall be 98% or greater of the Modified Proctor maximum dry density, ASTM D1557.

I. The Engineer shall have sole responsibility for interpreting all test results. The Contractor shall bear the cost of all retests due to failure to achieve specified requirements.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING (NOT USED)

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS

2.01 GENERAL (NOT USED)

2.02 ROCK BASE

A. The following sections of the Standard Specifications shall apply:

1. Section 200-1, Description.
2. Section 200-2, Materials.

2.03 STABILIZING MATERIALS

A. The following sections of the Standard Specifications shall apply:

1. Section 160-1, Description.
2. Section 160-2, Materials.

2.04 PRIME AND TACK COATS FOR BASE COURSES

A. The following sections of the Standard Specifications shall apply:

1. Section 300-1, Description.
2. Section 300-2, Materials.

2.05 ASPHALT

A. The following sections of the Standard Specifications shall apply:

1. Superpave Asphalt Concrete:

a. Section 334-1, Description.
b. Section 334-2, Materials.
c. Section 334-3, General Composition of Mixture.
d. Section 334-5, Acceptance of the Mixture.

2. Asphalt Concrete Friction Courses:

a. Section 337-1, Description.
b. Section 337-2, Materials.
c. Section 337-3, General Composition of Mixes.
d. Section 337-4, Mix Design.
e. Section 337-6, Acceptance of the Mixture.

2.06 RAISED RETROREFLECTIVE PAVEMENT MARKERS

A. The following sections of the Standard Specifications shall apply:

1. Section 706-1, Description.
2. Section 706-2, Materials.

2.07 TRAFFIC STRIPES AND MARKINGS

A. The following sections of the Standard Specifications shall apply:

1. Painted Pavement Markings:

a. Section 710-1, Description.
b. Section 710-2, Materials.

2. Thermoplastic Pavement Markings:

a. Section 711-1, Description.
b. Section 711-2, Materials.

PART 3 EXECUTION

3.01 EXCAVATION AND EMBANKMENT

A. The following sections of the Standard Specifications shall apply:

1. Section 120-1, Description.
2. Section 120-2, Classifications of Excavation.
3. Section 120-3, Preliminary Soils Investigation.
4. Section 120-4, Removal of Unsuitable Materials and Existing Roads.
5. Section 120-5, Disposal of Surplus and Unsuitable Material.
6. Section 120-6.1, Materials for Borrow.
7. Section 120-7, Materials for Embankment.
8. Section 120-8, Embankment Construction.
9. Section 120-9, Compaction Requirements.
10. Section 120-10, Acceptance Program.
11. Section 120-11, Maintenance and Protection of Work.
12. Section 120-12, Construction.

B. Exceptions

1. Section 120-4.1, Subsoil Excavation: Unsuitable soils shall be those in Classifications A-6, A-7, or A-8 in the American Association of State Highway and Transportation Officials (AASHTO) System.
2. Section 120-4.2, Construction Over Existing Old Road: Where removal of existing pavement is called for, it shall be removed to the full depth as indicated in the cross-sections and replaced with new limerock and paving or other treatment in accordance with the Drawings and details.
3. Section 120-5.2, Disposal of Muck on Side Slopes: Disposing of muck on side slopes shall not apply.
4. Section 120-9.2.1, General: Laboratory maximum dry density shall be determined by Modified Proctor, ASTM D1557. Field densities shall be determined by ASTM D1556/D1556M, D2167, or D6938. All embankments shall be compacted to not less than 95% of the maximum dry density, as determined by modified Proctor, ASTM D1557.
5. Section 120-12.1, Construction Tolerances: No tolerance greater than 0.1-foot above or below the plan cross-section will be allowed.

3.02 STABILIZING

A. The following sections of the Standard Specifications shall apply:

1. Section 160-3, Construction Methods.
2. Section 160-4, Acceptance Program.

B. Exceptions

1. Section 160-2.4, Granular Subbase: The Contractor may not substitute 6 inches of Granular Subbase for 12 inches of Stabilization unless such substitution is specifically indicated on the Drawings.
2. Section 160-4.2.1.2, Undertolerance in Bearing Value Requirements: no undertolerance will be acceptable.

3.03 LIMEROCK BEARING RATIO AND DENSITIES

A. Stabilized finish grade and stabilized shoulders shall have a minimum Limerock Bearing Ration (LBR) value of 40.

B. Field density of stabilized finished grade shall be a minimum of 98% of the Modified Proctor maximum dry density as specified in ASTM D1557 to a minimum depth of 12 inches as shown on the Drawings.

3.04 PRIME AND TACK COATS

A. The following sections of the Standard Specifications shall apply:

1. Section 300-3, Equipment.
2. Section 300-5, Cleaning Base and Protection of Adjacent Work.
3. Section 300-6, Weather Limitations.
4. Section 300-7, Application of Prime Coat.
5. Section 300-8, Application of Tack Coat.

3.05 ROCK BASE

A. The following sections of the Standard Specifications shall apply:

1. Section 200-3, Equipment.
2. Section 200-4, Transporting Rock.
3. Section 200-5, Spreading Rock.
4. Section 200-6, Compacting and Finishing Base.
5. Section 200-7, Acceptance Program.
6. Section 200-8, Priming and Maintaining.

B. Exceptions

1. Section 200-7.2.1, Density: The minimum density which will be acceptable for paved areas will be 98% of the maximum dry density as determined by Modified Proctor, ASTM D1557.

2. Section 200-7.3.1.2, Depth and Surface Testing Requirements: Thickness of base shall be measured at intervals not to exceed 200 feet.

3.06 ASPHALT

A. The following sections of the Standard Specifications shall apply:

1. Hot Mix Asphalt – Plant Methods and Equipment:

a. Section 320-6, Preparation of the Mixture.
b. Section 320-7, Transportation of the Mixture.

2. Hot Mix Asphalt – General Construction Requirements:

a. Section 330-1, Description.
b. Section 330-2, Quality Control (QC) Requirements.
c. Section 330-3, Limitations of Operations.
d. Section 330-4, Surface Preparation.
e. Section 330-5, Paving Equipment.
f. Section 330-6, Placing Mixture.
g. Section 330-7, Compacting Mixture.
h. Section 330-8, Joints.
i. Section 330-9, Surface Requirements.
j. Section 330-10, Protection of Finished Surface.

B. The Engineer reserves the right to test any portion of the roadway at any time.

C. Asphalt spread rate, tack, and temperature will be kept by the person responsible for quality control, and may be checked by the project's resident observer at any time.

3.07 PAVEMENT REPAIR

A. At his own expense the Contractor shall repair all damage to pavement as a result of work under this Contract in a manner satisfactory to the Engineer. Pavement shall be repaired to match the original surface material thickness and original grade. However, the asphalt concrete thickness shall not be less than 2 inches. The repair shall include preparing the subgrade, placing and compacting the applicable base, priming the limerock base, and placing and maintaining the surface treatment as specified in this Section.

B. The width of all repairs shall extend at least 12 inches beyond the limit of the damage. The edge of the pavement to be left in place shall be cut to a true edge with a saw or other approved method so as to provide a clean edge to abut the

repair. The line of the repair shall be reasonably uniform with no unnecessary irregularities.

3.08 JOINTS

A. General pavement joints within asphalt or concrete driveways and roadways and where specified or directed by the Engineer, shall be mechanically sawed butt joints. The edges of asphalt pavement shall be trimmed to straight lines which a roller can follow or formed.

3.09 RAISED RETROREFLECTIVE PAVEMENT MARKERS

A. The following sections of the Standard Specifications shall apply:

1. Section 706-3, Equipment.
2. Section 706-4, Application.
3. Section 706-5, Contractor's Responsibility for Notification.

3.10 TRAFFIC STRIPES AND MARKINGS

A. The following sections of the Standard Specifications shall apply:

1. Painted Pavement Markings:

    a. Section 710-3, Equipment.
    b. Section 710-4, Application.
    c. Section 710-5, Tolerances in Dimensions and in Alignment.
    d. Section 710-6, Contractor's Responsibility for Notification.
    e. Section 710-7, Protection of Newly Painted Pavement Markings.

2. Thermoplastic Pavement Markings:

    a. Section 711-3, Equipment.
    b. Section 711-4, Application.
    c. Section 711-5, Contractor's Responsibility for Notification.
    d. Section 711-6, Protection of Newly Applied Traffic Stripes and Markings.

END OF SECTION

SECTION 02740
DIRECTIONAL DRILLING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes furnishing all labor, materials, equipment, and incidentals necessary to complete each directional drill installation shown on the Drawings and as specified herein.

1.02 SUBMITTALS

The following shall be submitted in sufficient detail to show full compliance with the specification:

A. Qualifications: Submit statement of qualifications and records of previous similar jobs.

B. Product Pipe: Submit manufacturer's catalog data for the product pipe as required in the pipe specifications. The product data shall also include the dimension ratio, minimum allowable bending radius, and the safe pull force for each product pipe being installed by directional drill.

C. Drilling Fluids: Submit a complete list of all drilling fluids, additives, and mixtures to be used along with Material Safety Data Sheets.

D. Software: Submit indication of the software that the Contractor will use to perform analyses in accordance with Article 1.03, Quality Assurance.

E. Analyses: Submit software analyses results in accordance with Article 1.03, Quality Assurance.

F. Contingency Plan: Submit a hydraulic fracture (frac-out) contingency plan in accordance with Article 1.03, Quality Assurance.

G. Equipment: Submit a description of the rig(s) proposed for the project at each location, showing the method of control of the boring head, head type, pulling force of the equipment, age, reamer type(s), manufacturer type, and other germane information. This information shall demonstrate that the equipment pulling force is at least 1.25 the maximum calculated peak-pulling requirement.

H. Certificates: Submit statement that the Contractor has inspected the drill equipment including the drill rod and determined that they are in satisfactory condition for its intended use.

I. Bore Plan: The Contractor shall submit a signed-and-sealed bore plan before commencing drilling activities.

J. Record Drawings: Submit an electronic copy and three hard copies of the record drawings within 5 days after completing the pull back in accordance with the Article 1.06, Record Drawings.

K. Drilling Logs: Maintain and submit upon completion of work complete drilling logs of guided directional drill operations.

1.03 QUALITY ASSURANCE

A. The proposed product pipe installation lengths, depths, and curvatures presented on the Drawings are for bidding purposes only. The Contractor shall be solely responsible for the successful installation of each product pipe. The Contractor shall analyze each installation and make modifications necessary to successfully install each product pipe.

B. The Contractor shall analyze each installation using BoreAid ™, DrillPath ™, or other approved software and perform hand calculations as necessary if the Contractor's software is not capable performing all of the required analyses. The results of the analyses/calculations shall be submitted and shall include as a minimum the following:

1. Proposed entry and exit angles.
2. Proposed radii of curvature for all directional changes.
3. Proposed profile and drill path. The profile shall show ground surfaces, waterway bottoms/beds (if applicable), and proposed product pipe installation.
4. Product pipe deflection, buckling, external pressure, and stress calculations demonstrating that the forces/stresses exerted on the product pipe during and after installation will not exceed 80% of the manufacturer's safe limits.
5. Pull back force calculations demonstrating that peak pulling requirement does not exceed 80% of the manufacturer's safe pull pack force.
6. Maximum borehole pressure calculations and demonstration that the maximum borehole pressure will not result in a hydraulic fracture (frac-out).
7. Method of buoyancy control (if required/used) to reduce forces/stresses exerted on the product pipe.

C. The Contractor shall submit a frac-out contingency plan that describes frac-out planning, prevention, monitoring, response, notification to the Owner, Engineer, and regulatory agencies, and cleanup procedures.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Delivery, storage, and handling shall be in accordance with Section 01650, Delivery, Storage, and Handling, and the additional requirements herein.

B. Inspect materials delivered to the site for damage. All materials found during inspection or during the progress of work to have cracks, flaws, surface abrasions, or other defects shall be rejected and removed from the job site.

C. Disposal of fluids is the responsibility of the Contractor. Disposal of fluids shall be done in a manner that is in compliance with all permits and applicable federal, state, and local regulations.

1.05 QUALIFICATIONS

A. The Contractor's superintendent and driller assigned to this project must be experienced in work of this nature and must have successfully completed a minimum of five similar projects of similar length, pipe type, pipe size, and soil type using directional drilling in the last 3 years. Conventional open-trenching experience or bore-and-jacking experience will not be acceptable substitutes for directional drilling experience.

B. As part of the bid submission, the Contractor shall submit documentation of such project(s). The documentation for experience shall include but not be limited to the following:

1. Name(s) and description(s) of project(s).
2. Résumés of project manager, superintendent, and driller assigned to the specific project.
3. Pipe type(s), diameter(s), and lengths.
4. Type and manufacturer of equipment used.
5. Soil conditions encountered.
6. Start and completion dates.
7. Contact names, numbers, and addresses.

1.06 RECORD DRAWINGS

A. The record drawings shall include a plan, profile, and all information recorded during the progress of the work. The Record Drawings shall be tied to the project's survey control.

1.07 DEFINITIONS

A. *Horizontal Directional Drilling (HDD):* A steer-able system for the underground installation of pipes, conduits, and cables using a surface launched rig. A pilot bore is drilled using a rotating drill string and then is enlarged by a back reamer to the size required for the product pipe. The necessary deviation during pilot boring is provided by a slanted face to the drill head, an asymmetric drill head, eccentric fluid jets, or a combination of these, usually in conjunction with an aboveground electronic locator or a remote guidance system.

B. *Maxi (Conventional) HDD*: Typically used for the largest-diameter pipelines/ conduits and longest length installations. Pipe diameters are typically 18 inches or larger, lengths can exceed 1,000 feet, and the pullback force is typically in excess of 70,000 pounds. The drill string is usually remote tracked provided from sensors near the leading end of the drill string.

C. *Mini HDD:* Typically used for the smaller diameter pipelines/conduits and for shorter distances. Pipe diameters are typically 6 inches or smaller, lengths are less than 600 feet, and pullback forces are up to 20,000 pounds. The drill string is typically tracked with a surface held walkover transmitter/receiver.

D. *Midi HDD:* Typically used for intermediate sizes and lengths of pipelines/ conduits. Pipelines are typically between 6 inches and 18 inches diameter, lengths are up to 1,000 feet, and pullback forces from 20,000 to 70,000 pounds. Midi HDD equipment may employ similar capabilities to the Maxi HDD rigs but have more limitations on capacity. The drill string is typically tracked with a surface held walkover transmitter/receiver.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Boring equipment shall be matched to the conditions of the project and shall have a pulling force at least 1.25 the maximum calculated peak-pulling requirement for each installation given the site-specific conditions.

B. Boring equipment shall have a mechanical drilling rig with a controlled directional boring head using either a fluid or mechanical cutting head (or

combination of both), assisted and cooled by an approved drilling fluid of low pressure and volume.

C. Approved boring equipment shall be that manufactured by American Augers, Case Construction, Charles Machine Works (Ditch Witch), Straight Line, Tulsa Rig Iron, Vermeer, or approved equal.

D. The location/tracking system employed for determining the location of the drilling head during the pilot bore shall include but not be limited to the position of the boring head, the roll angle, the tilt angle, depth below grade, temperature of data transmitter, and remaining battery life.

E. The Contractor shall select the appropriate drill equipment, which at least meets the minimum requirements established in this specification, to be used for this project.

F. The drill equipment including rod shall be inspected and approved for use by the Contractor before arrival at the work site.

2.02 DRILLING FLUIDS

A. A high-quality drilling fluid shall be used to ensure hole stability, cuttings transport, bit and electronics cooling, and hole lubrication to reduce drag on the drill pipe and the product pipe. Composition of the fluid must comply with all federal, state, and local environmental regulations.

B. The drilling fluid shall be a bentonite slurry mixed with potable or reclaimed water (of proper pH) to ensure no contamination is introduced into the soil during the drilling, reaming, or pipe installation process. The Contractor is responsible for any required pH adjustments. A polymer-based slurry will be considered only if the Contractor demonstrates that a bentonite slurry will not suitable for this project and the proposed polymer slurry is acceptable to the Florida Department of Environmental Protection. Drilling fluids that are petroleum-based or that contain additives that may contaminate the surrounding soils or groundwater shall not be allowed.

C. The type of proposed drilling fluid with a complete listing of all additives along with Material Safety Data Sheets shall be submitted for approval before work begins.

D. Potable water or reclaimed water will be made available to the Contractor. This water will be metered and invoiced to the Contractor at the current effective rate.

2.03 PRODUCT PIPE

A. The nominal diameter and material type of each product pipe shall be as shown on the Drawings.

B. High-Density Polyethylene (HDPE) pipe shall conform to the requirements of Section 15146, High-Density Polyethylene (HDPE) Pipe. The maximum dimension ratio (i.e., the thinnest allowable wall thickness) for HDPE pipe being installed by direction drill shall be 11 (DR11).

PART 3 EXECUTION

3.01 GENERAL

A. No work or drilling shall commence until the Contractor has submitted the required information and a signed-and-sealed bore plan and received written approval from the Engineer regarding the drill path and related procedures.

B. The Contractor shall locate all utilities, structures, etc., within the construction area before any work begins and before equipment is mobilized.

C. Before drilling operations begin, all erosion control devices and dewatering shall be in-place and functional in accordance with Section 02240, Dewatering, and the Contract Documents.

D. The boring rig shall be sufficiently and adequately anchored for the task.

E. Directional drilling equipment machine safety requirements shall include common grounding system to prevent electrical shock in the event of underground electrical cable strike. The grounding system shall connect all pieces of interconnecting machinery; the drill, mud mixing system, drill power unit, drill rod trailer, operator’s booth, worker grounding mats, and any other interconnected equipment to a common ground. The drill shall be equipped with an "electrical strike" audible and visual warning system that will notify the system operators of an electrical strike.

F. The Contractor shall conform to all requirements of Section 02305, Earthwork for Utilities, including, but not limited to, excavation, protection of persons and property, sheeting and shoring, backfill and compaction, and disposal of excess and waste materials.

G. The Contractor shall be responsible for transporting, containing, and storing any water required for the drilling operations, cleanup, and other needs.

H. All drilling fluid excess shall be contained in entry and/or exit pits and pumped/treated/stored as needed to preclude spills and escape to the surrounding environment. Ensure that entry and exit pits are of sufficient size and volume to contain the expected return of drilling fluids and cuttings.

I. Drilling fluid returns can be collected in the entrance pit, exit pit, or spoils recovery pit. The Contractor shall immediately clean up any drilling fluid spills or overflows from these pits.

J. Disposal of the drilling fluids shall be the responsibility of the Contractor and shall be conducted in compliance with all relative environmental regulations, right-of-way and workspace agreements, and permit requirements.

K. The product pipe shall be installed within the limits indicated on the Drawings.

3.02 DRILL SET-UP AND PITS

A. The Contractor may use the set-up areas identified on the Drawings. If additional areas are required, the Contractor shall be responsible for coordinating the additional areas at no additional cost to the Owner.

B. Drill entrance and exit pits are required. The Contractor shall be responsible for design and construction of the drill entrance and exit pits.

C. The drill entrance and exit pits shall be maintained at minimum size to allow only the minimum amount of drilling fluid storage before transfer to mud recycling or processing system or removal from the site.

D. Drilling mud shall not be allowed to flow freely on the site or around the entrance or exit pits. Erosion and sediment control devices shall be set up around each pit. Mud spilled shall be removed as soon as possible and the ground restored to original condition. Pits shall be shored to OSHA standards and the requirement of Section 02305, Earthwork for Utilities.

3.03 DRILL ENTRANCE AND EXIT ANGLE

A. The entrance and exit angles shall such that the elevation profile maintains adequate cover to reduce risk of frac-out and that ground exit occurs as specified herein. The Contractor shall be responsible for ensuring that entrance and exit angles ensure pullback forces do not over stress the pipe.

B. In no case shall the entry or exit angles of the installed pipeline shall be less than 8 degrees from the horizontal and or more than 18 degrees from the horizontal.

C. In addition to the allowable limits of Paragraph 3.04B, the entry and exit angles shall in accordance with those used in the analyses performed in Article 1.03, Quality Assurance.

3.04 PILOT HOLE

A. A pilot hole shall be drilled for all product pipe installations 6-inch-diameter and larger.

B. The type and size of the pilot string cutting head and the diameter of the drill rod shall be selected by the Contractor for each specific application.

C. The cutting head shall be assisted by and cooled by drilling fluid of low pressure and volume.

D. The pilot hole shall be drilled along the approved path. Pilot hole tolerances are as follows:

1. Vertical tolerance: Provide cover in accordance with the approved profile developed under Article 1.03, Quality Assurance.
2. Horizontal tolerance: 3 feet from the centerline of the product pipe.
3. Curve Radius: No curve will be accepted with a radius less than 1.25 times the manufacturer's recommended minimum bending radius for the product pipe being installed by directional drill. NOTE: There are additional stresses imposed on the product pipe due to pulling it around curves versus bending the product pipe in a trench. The minimum bending radius for a product pipe installed by direction drill is greater than the minimum bending radius for the same product pipe installed in a trench.
4. Entry Point Location: The pilot hole entry point shall be established by the Contractor.
5. Exit Point Location: The exit point location shall be established by the Contractor.
6. The installed pipeline cover requirements as shown on the drawings and as specified herein shall not be violated.

E. If significant differing soils or strata from those provided in the geotechnical data and reports are encountered during the pilot boring, the Contractor shall be responsible for changing the drill head and slurry and other means as may be appropriate to complete the bore.

F. The Contractor shall adjust the viscosity of the drilling fluid to match the conditions of the project. The Owner shall bear no responsibility for loss of drilling fluid or loss of drilling equipment if an obstacle or unknown condition is encountered during the work.

G. The Owner shall not be responsible for underground obstacles (such as boulders, tree stumps, loose and unconsolidated soils, hard rock, or utilities) or structures that may be encountered during the work.

H. If hydraulic fracture occurs, the Contractor shall implement the approved frac-out contingency plan and repair all related damages, cleanup of fluids, and make corrections to preclude future events. Such corrections may include but not be limited to re-profiling the bore or changing the viscosity of the drilling fluid or plugging the fracture or a combination of these. If the borehole is abandoned and an alternate route is chosen, the abandoned borehole shall be filled with excavatable flowable fill.

I. Where construction activities are close to or under water bodies (lakes, creeks, canals, retention basins) or wetlands, special attention shall be given to the proposed profile to ensure that hydraulic fracture does not occur under the water feature. Additionally, silt fences and similar approved erosion control devices shall be used to protect the water body(s) from the construction activities.

3.05 BACK-REAMING

A. Back-reaming shall be required for all product pipe installation 6-inch-diameter and larger.

B. The type of back-reamer to be utilized shall be determined by the type of subsurface soil conditions that are encountered during the pilot hole drilling operation. The back-reamer type shall be selected by the Contractor for each specific application.

C. Back-reaming shall be conducted in single or multiple passes of the borehole and shall enlarge the borehole to at least 1.4 times the outer diameter of the product pipe to be installed. Larger reaming may be required depending on subsurface conditions encountered. The number of back-reaming passes and the borehole size, provided the minimum requirements are met, shall be the Contractor’s discretion.

3.06 PULL BACK

A. Unless approved otherwise, the entire product pipeline to be installed via directional drill shall be fully assembled before commencement of pull back operations.

B. The product pipeline shall be supported during pullback operations in a manner to enable it to move freely and prevent damage. Properly spaced rollers and at

proper heights shall be used to transition the product pipe from the horizontal to oblique positions for insertion into the borehole.

C. Unless approved otherwise, the product pipeline shall be installed in one continuous pull.

D. The product pipe shall be installed with a continuous #10-gauge tracer wire of sufficient type to remain intact and usable upon completion of the installed product pipe.

E. Torsional stress shall be minimized by using a swivel to connect the pull section to the reaming assembly.

F. Maximum allowable tensile force imposed on the pull section shall not exceed 80% of the pipe manufacturer's safe pull (or tensile) strength. If the pull section is made up of multiple pipe size or materials, the lowest safe pull strength value shall govern and the maximum allowable tensile force shall not exceed 80% of this value.

G. External pressure shall be minimized during installation of the pullback section in the reamed hole. Damaged pipe resulting from external pressure shall be replaced at no cost to the Owner. Buoyancy modification shall be at the discretion of the Contractor.

H. The Contractor shall take precautions to protect the product pipeline from damage and marring during the installation and pullback operation. Such precautions shall include but not be limited to using rollers, pulleys, idlers, and trunnions.

I. After pullback is completed, the Contractor shall “rest” the product pipeline to allow for any contraction and shrinkage for at least 24 hours. No additional work on the pulled product pipeline shall be allowed during the resting period.

3.07 GUIDANCE SYSTEMS

A. Walkover guidance systems are acceptable for this project. A magnetic survey tool located behind the pilot string cutting head shall also be used for this project.

3.08 DOCUMENTATION

A. The Contractor shall maintain drilling logs that accurately provide drill bit location (both horizontally and vertically) at least every 15 feet along the drill path. In addition, logs shall be kept that record, as a minimum, the following

every 15 minutes throughout each drill pass, back-reaming pass, or product pipe installation pass:

1. Drilling fluid pressure.
2. Drilling fluid flow rate.
3. Drilling fluid temperature.
4. Drill thrust force.
5. Drill pullback force.
6. Drill head torque.

B. Each day, the Contractor shall also record the total amount of drilling mud used and viscosity of the drilling mud. If the viscosity of the drilling mud is changed, the Contractor shall record the new viscosity and the time the mud viscosity was changed.

C. Samples of each log sheet shall be submitted to the Owner/Engineer for approval before work begins.

D. The Engineer shall have access to instrumentation, readings, and logs at all times during operation.

E. After the pull is completed, the Contractor shall provide Record Drawing information of the installed product pipeline. The Record Drawing information shall provide the horizontal and vertical location of the product pipeline tied to the project control datum. At a minimum, the entry and exit locations, angles, and elevations shall be recorded and the locations and depths of the product pipeline shall be recorded at intervals along the entire length of the profile. For profiles under non-submerged surfaces, the interval shall be 10 feet. For profiles under submerged surfaces (such as a lake, stream, canal, or river), the interval shall be 20-foot. This information shall be provided to the Owner/Engineer within 7 calendar days after the completion of each bore path.

3.09 MAINTENANCE OF TRAFFIC

A. During assembly and pullback of the pipe, the pipe must be laid out in such a way to minimize disrupting and interfering with vehicular and pedestrian traffic or other operational conflicts that the Owner/Engineer identify.

B. The Contractor shall be responsible for safe maintenance of pedestrian and vehicular of traffic. If the construction activities require such action a maintenance-of-traffic plan shall be submitted to the Owner/Engineer for approval before work begins. The plan shall be in accordance with Florida Department of Transportation Standard Index 600 Series and Technical Specifications.

3.10 UTILITY LOCATES

A. The Contractor shall locate all utilities before start of excavation or drilling. The Contractor shall be responsible for damage to utilities and shall repair damaged utilities at no cost to the Owner.

3.11 CLEANUP

A. Immediately upon completion of work of this Section, all rubbish and debris shall be removed from the job site. All construction equipment and implements of service shall be removed and the entire area involved shall be left in a neat condition acceptable to the Engineer.

B. "Blow holes" or "breakouts" of drilling fluid to the surface shall be cleaned up immediately and the surface area returned to its original condition. All drilling fluids, spoils, and separated materials shall be disposed of in compliance with federal, state, and local environmental regulations.

C. After the product pipe installation is completed, the Contractor shall restore the pits and drill rig anchors and work areas to their pre-construction or better condition. Seeding shall not be allowed in lieu of sod unless granted in writing by the Owner/Engineer.

END OF SECTION

SECTION 02920
SEEDING AND SODDING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall provide all materials, equipment, labor, and work to construct the project in accordance with the Contract Documents. No time extensions shall be given to the Contractor for not establishing a grass or sod cover during the "proper" planting season.

B. This work includes but is not limited to the following items specified in this Section:

1. Placing sod to provide grass as finished ground cover at all unpaved disturbed areas of the site, including the entire areas of the ponds shall be as indicated on the Contract Drawings.
2. Placing seed to provide grass as finished ground cover in areas (not designated to be sodded) that were disturbed by the work. Provide seed and topsoil for all areas not designated to be sodded that have been disturbed or are indicated on the Contract Drawings to be seeded.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction, latest edition:

1. FDOT Section 570 Performance Turf.
2. FDOT Section 981 Turf Materials.
3. FDOT Section 982 Fertilizer.
4. FDOT Section 983 Water for Grassing.
5. FDOT Section 987 Soil Layer Materials.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. Deliver, store, protect, and handle products to the site to prevent damage from wetness and weather conditions.

C. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

D. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of the manufacturer.

1.06 MAINTENANCE

A. Maintenance shall be as indicated under Part 3, Execution, of this Section.

1.07 DEFINITIONS

A. Weeds: Weeds include but are not limited to Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragqwort, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.08 REGULATORY REQUIREMENTS

A. The Contractor shall comply with regulatory agencies for fertilizer and herbicide composition.

PART 2 PRODUCTS

2.01 GENERAL (NOT USED)

2.02 MATERIALS

A. Topsoil

1. Top soil shall be supplied and installed in accordance with FDOT Standard Section 987.

B. Fertilizer

1. Fertilizer shall be a complete, commercial-grade mixture of 12-8-8 analysis.
2. Fertilizer shall conform to applicable state laws for the material used.
3. Commercial-grade mixture shall conform to FDOT Standards, Section 982.

C. Mulch

1. Mulch shall conform to FDOT Standards, Section 981.
2. Mulch shall be dry grain straw or hay, free of noxious weeds.
3. Mulch shall be thoroughly cured and dried before use.
4. Forest litter, pine needles, or Spanish Moss will not be acceptable.

D. Seed

1. All grass seed shall be the product of a reputable supplier and shall conform to the requirements of the State Department of Agriculture and Consumer Services and all applicable state laws.
2. Grass seed shall conform to FDOT Standards Section 981, with a minimum 80% purity and 80% germination with no noxious weeds.
3. Seed shall be Argentine Bahia applied at a minimum rate of 10 pounds per 1,000 square feet. A thick stand of grass shall be provided.

E. Sod

1. Sod shall conform to FDOT Standards Section 981. A thick stand of grass shall be provided at all locations.
2. Sod shall be Argentine Bahia.
3. Sod planted on private properties shall match the existing sod when practical.

F. Water

1. The water used to produce grass may be obtained from any approved source, in accordance with FDOT Section 983. The water shall be free of excess and harmful chemicals, acids, alkalies, and all substances which may be harmful to plant growth or obnoxious to traffic. Salt or brackish water shall not be used. The Contractor shall make arrangements to secure and pay for water. The Contractor shall make all provisions necessary to water until a thick stand of grass is established.

PART 3 EXECUTION

3.01 SURFACE PREPARATION

A. The entire area to be seeded, as shown on the Drawings or required in this Section, shall be covered with a 6-inch layer of muck or suitable topsoil, carefully spread and disked lightly into the existing soil and finished to the grades indicated.

3.02 FERTILIZING

A. Fertilizer shall be applied uniformly on the surface of the ground at a minimum rate as specified in Section 570 of FDOT Specifications. It shall be mixed into the soil with a disk harrow, where practicable, or by hand-raking in areas of limited accessibility. Mixing shall be continued until the fertilizer is uniformly incorporated into the top 3 inches of soil.

3.03 MULCHING

A. After spreading and mixing the fertilizer, the Contractor shall apply approximately 2 inches, loose thickness, of the mulch material uniformly over the grassing area and cut into the soil to produce a loose mulch thickness of 3 to 4 inches, in accordance with Section 570 of FDOT Specifications. Care shall be exercised to prevent the mulch from being cut too deeply into the soil.

3.04 SEEDING

A. Seed which has become wet or moldy shall not be used. Soon after the mulch material has been cut into the soil and while the soil is still loose and moist, the seed shall be scattered uniformly over the grassing area. Application shall be in conformance with FDOT Standards, Section 570.

3.05 SODDING

A. Application shall be in accordance with FDOT Standards, Section 575.

3.06 WEED CONTROL

A. The Contractor shall apply herbicides as required and as recommended by the County Agricultural Agent. Herbicides shall only be applied as needed.

3.07 COMPACTION

A. Immediately after the seeding is complete, the entire grassed or mulched area shall be compacted with a light roller. Rolling shall be continued until the area is firmly but not tightly packed.

3.08 EQUIPMENT

A. All equipment used in the operation of grassing shall be adequate to produce the required results. Equipment for placing mulch material into the soil shall be suitable for cutting the specified materials uniformly into the soil and to the required controlled depth. Rollers shall have corrugated or notched surfaces and shall be at least 12 inches in diameter. Smooth surface rollers will not be permitted.

3.09 GROUND COVER DATA

A. Planting dates, types of seeds, seed mixtures, and rates of application shall be as set forth in this Section. No changes may be made in the ground cover type without the approval of the Engineer.

3.10 GROUND COVER ESTABLISHMENT

A. General Requirements

1. The Contractor shall provide ground cover (sod and seed) establishment of the specified permanent vegetation before final acceptance of the project with no dead areas of ground cover. Groundcover (sod and seed) establishment shall consist of necessary preserving and protecting to keep the grassed areas in a satisfactory condition. The Contractor shall water the grassed areas as long and as often as necessary to promote maximum practicable growth. At any time, the Engineer may require replanting an area or portion of an area which, for any cause, shows unsatisfactory growth. Except as otherwise specified or permitted by the Engineer, the Contractor shall prepare areas to be replanted in accordance with the

requirements of the Specifications as if such replanting were the initial planting. However, the type of fertilizer and the applicable rate of fertilizer to be furnished and applied by the Contractor as part of plant establishment occasioned by replanting shall be determined by soil tests or otherwise established.

B. Growth and Coverage

1. The Contractor shall be responsible for providing satisfactory growth and coverage as defined below. Growth and coverage shall be considered acceptable when all areas show a satisfactory visible growth with no bare spots larger than 1 square foot. Bare spots shall be scattered, and the total bare areas should not comprise more than 1/100 of any given area.

3.11 EXTENT OF SOD/GRASS MAINTENANCE

A. The Contractor is responsible for all sod and grass maintenance until the date of final completion of the project. Sod and grass maintenance include cutting, watering, fertilizing, re-seeding, and re-sodding as required to maintain the required coverage of healthy, vibrant grass and sod cover.

END OF SECTION

DIVISION 3

CONCRETE

SECTION 03301
CONCRETE AND REINFORCING STEEL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and incidentals required to perform all concrete work as ordered by the Engineer, as shown on the Drawings, and as specified in this Section.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance. Reproductions of contract drawing are unacceptable. Submit full fabrication drawings and technical data on all materials and components. Submit other data specified in this Section when required. Submittals shall include at least the followings:

A. Shop Drawings and Technical Data

1. Joints and joint accessories.
2. Reinforcing steel including bar schedules and bending details.
3. Concrete mix for each formulation of concrete proposed for use, including constituent quantities per cubic yard, water cementitious ratio, type, and manufacturer of cement.
4. Formwork and accessories.
5. Grout.
6. Each type of mechanical reinforcing steel connector.

B. Samples

1. Two samples of each type of mechanical reinforcing steel connection.

C. Test Reports

1. Sieve analysis of fine and coarse aggregates.

2. Concrete mix for each formulation of concrete proposed for use, including constituent quantities per cubic yard, water cementitious ratio, type and manufacturer of cement, and either a. or b. below:

a. Standard deviation data for each proposed concrete mix based on statistical records.

b. Water cementitious ratio curve for each proposed concrete mix based on laboratory tests. Give average cylinder strength test results at 28 days for laboratory concrete mix designs. Provide results of 7- and 14-day tests if available.

3. Concrete compressive strength, air content, and slump tests.

D. Certifications

1. Certify that admixtures used in the same concrete mix are compatible with each other and the aggregates.
2. Material Safety Data Sheet (MSDS).
3. Curing concrete elements.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Concrete Institute (ACI)

1. ACI 117—Specification for Tolerances for Concrete Construction and Materials and Commentary.
2. ACI 211.1—Standard Practice for Selecting proportions for Normal, Heavyweight, and Mass Concrete.
3. ACI 301—Specifications for Structural Concrete.
4. ACI 305R—Guide to Hot Weather Concreting.
5. ACI 306R—Guide to Cold Weather Concreting.
6. ACI 306.1—Standard Specification for Cold Weather Concreting.
7. ACI 315—Details and Detailing of Concrete Reinforcement.
8. ACI 318—Building Code Requirements for Structural Concrete and Commentary.
9. ACI 347R—Guide to Formwork for Concrete.
10. ACI 350R—Environmental Engineering Concrete Structures.
11. ACI MCP-4—Manual of Concrete Practice – Volume 4.

B. American Society for Testing and Materials (ASTM)

1. ASTM A615/A615M—Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
2. ASTM A1064/A1064M—Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

3. ASTM C31/C31M—Standard Practice for Making and Curing Concrete Test Specimens in the Field.
4. ASTM C33/C33M—Standard Specification for Concrete Aggregates.
5. ASTM C94/C94M—Standard Specification for Ready-Mixed Concrete.
6. ASTM C143/C143M—Standard Test Method for Slump of Hydraulic-Cement Concrete.
7. ASTM C150/C150M—Standard Specification for Portland Cement.
8. ASTM C171—Standard Specification for Sheet Materials for Curing Concrete.
9. ASTM C173/C174M—Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
10. ASTM C231/C231M—Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
11. ASTM C260/C260M—Standard Specification for Air-Entraining Admixtures for Concrete.
12. ASTM C309—Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
13. ASTM C494/C494M—Standard Specification for Chemical Admixtures for Concrete.
14. ASTM C618—Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
15. ASTM C827/C827M—Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures.
16. ASTM C881/C881M—Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
17. ASTM C920—Standard Specification for Elastomeric Joint Sealants.
18. ASTM C932—Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering.
19. ASTM C990—Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.
20. ASTM C1107/C1107M—Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
21. ASTM C1116/C1116M—Standard Specification for Fiber-Reinforced Concrete.
22. ASTM D1751—Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
23. ASTM D1752—Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
24. ASTM D2103—Standard Specification for Polyethylene Film and Sheeting.

25. ASTM D4397—Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
26. ASTM D6690—Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

C. Concrete Reinforcing Steel Institute (CRSI)

1. MSP—Manual of Standard Practice.

1.04 QUALITY ASSURANCE

A. Reinforced concrete shall comply with ACI 318; the recommendations of ACI 350R; and other stated requirements, codes, and standards. The most stringent requirement of the codes, standards, and this Section shall apply when conflicts exist.

B. Only one source of cement and aggregates shall be used on any one structure. Concrete shall be uniform in color and appearance.

C. Thirty days in advance of placing concrete, the Contractor shall discuss with the Engineer the sources of individual materials and batched concrete proposed for use. Discuss placement methods, waterstops, and curing. Propose methods of hot and cold weather concreting as required. Before placing any concrete containing a high-range water-reducing admixture (plasticizer), the Contractor, accompanied by the plasticizer manufacturer, shall discuss with the Engineer the properties and techniques of batching and placing plasticized concrete.

D. A firm providing field testing and inspection services will be approved by the Owner. The cost of such work, except as specifically stated otherwise, shall be paid by the Contractor and reimbursed by the Owner under the Concrete Testing Allowance. The following items shall be tested by the Owner to verify conformity with this Section:

1. Concrete placements—compressive strength (cylinders), compressive strength (cores), slump, and air content.
2. Other materials or products that may come under question.
3. All materials incorporated in the work shall conform to accepted samples.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

B. Furnish the Owner with a written warranty that the mechanical splice system is free from manufacturing defects and will perform as represented.

PART 2 PRODUCTS

2.01 GENERAL

A. The use of the manufacturer's name and model or catalog number is to establish the standard of quality and general configuration desired.

B. Like items of materials shall be the end products of one manufacturer to provide standardization of appearance, maintenance, and manufacturer's service.

C. Materials shall comply with this Section and any applicable State or local requirements.

2.02 MATERIALS

A. Cement: Domestic Portland cement complying with ASTM C150/C150M. Air entraining cements shall not be used. The brand of cement shall be subject to approval by the Engineer and one brand shall be used throughout the Work. The following cement type(s) shall be used:

1. Class A, B, C, D Concrete Type II with the addition of fly ash resulting in C3A being below 5% of total cementitious content, Type III limited to 5% C3A, or Type V.

B. Aggregate: Washed inert natural sand conforming to the requirements of ASTM C33/C33M.

C. Water: Potable water free from injurious amounts of oils, acids, alkalis, salts, organic matter, or other deleterious substances.

D. Admixtures: Admixtures shall be free of chlorides and alkalis (except for those attributable to water). When more than one admixture is required to be used in a concrete mix, the admixtures shall be from the same manufacturer. Admixtures shall be compatible with the concrete mix, including other admixtures, and shall be suitable for use in contact with potable water after 30 days of concrete curing.

1. Air-Entraining Admixture—The admixture shall comply with ASTM C260/C260M.
2. Water-Reducing Agent—The admixture shall comply with ASTM C494/C494M, Type A.

3. High-Range Water-Reducer (Plasticizer)—The admixture shall comply with ASTM C494/C494M, Type F and shall result in non-segregating plasticized concrete with little bleeding and with the physical properties of low water/cement ratio concrete. The treated concrete shall be capable of maintaining its plastic state more than 2 hours.
4. Admixtures causing retarded or accelerated setting of concrete shall not be used without written approval from the Engineer. When allowed, the admixtures shall be retarding or accelerating water-reducing or high-range water-reducing admixtures.

E. Pozzolan (Fly Ash) shall be Class F fly ash complying with ASTM C618, except that the Loss on Ignition (LOI) shall be limited to 3% maximum.

F. Materials for Curing Concrete

1. Sheet Curing Materials—Waterproof paper, polyethylene film, or white burlap polyethylene sheeting shall comply with ASTM C171.
2. Liquid Curing Compound—Liquid membrane forming curing compound shall comply with the requirements of ASTM C309, Type 1 D (clear or translucent with fugitive dye) and shall contain no wax, paraffin, or oil. The curing compound shall be approved for use in contact with potable water after 30 days according to NSF 61 (non-toxic and free of taste or odor).

G. Chemical hardener shall be Lapidolith by Sonneborn, Hornolith by A.C. Horn, Penalith by W.R. Meadows, or equal fluosilicate base material.

H. Concrete sealer shall be "Kure N Seal," by Sonneborn, Minneapolis, MN, or equal.

2.03 MIXES

A. Select proportions of ingredients to meet the design strength and materials limits specified in Table 1 and to produce concrete having proper workability, durability, strength, appearance, and other required properties. Proportion ingredients to produce a homogenous mixture, which will readily work into corners and angles of forms and around reinforcement without permitting materials to segregate or allowing excessive free water to collect on the surface.

B. The design mix shall be based on standard deviation data of prior mixes with essentially the same proportions of the same constituents or, if such data are not available, be developed by a testing laboratory acceptable to the Engineer and engaged by and at the expense of the Contractor. Mixes based on standard deviation shall be accepted based on the modification factors for standard

deviation tests contained in ACI 318. The water content of the concrete mix, determined by laboratory testing, shall be based on a curve showing the relation between water cementitious ratio and 7- and 28-day compressive strengths of concrete made using the proposed materials. The curves shall be determined by four or more points, each representing an average value of at least three test specimens at each age. The curves shall have a range of values sufficient to yield the desired data, including the specified design strengths as modified below, without extrapolation. The water content of the concrete mixes to be used, as determined from the curve, shall correspond to strengths 16% greater than the specified design strengths. The resulting mix shall not conflict with the limiting values for maximum water cementitious ratio and net minimum cementitious content as specified in Table 1.

C. Entrained air, as measured by ASTM C231/C231M, shall be as shown in Table 1.

1. If the air-entraining agent proposed for use in the mix requires testing methods other than those in ASTM C231/C231M to accurately determine air content, make special note of this requirement in the admixture submittal.

D. Slump of the concrete as measured by ASTM C143/C143M shall be as shown in Table 1. If a high-range water-reducer (plasticizer) is used, the slump indicated shall be that measured before plasticizer is added. Plasticized concrete shall have a slump ranging from 7 to 10 inches.

TABLE 1
CONCRETE MIX REQUIREMENTS

Class	Design Strength (1)	Cement (2)	Fine Aggregate (2)	Coarse Aggregate (3)	Cementitious Content (4)
A	2500	C150 Type II	C33	57	440 min.
B	3000	C150 Type II	C33	57	480 min.
C	4000	C150 Type II	C33	57	560 min.
D	5000	C150 Type II	C33	57	600 min.

Class	W/C Ratio (5)	Fly Ash	AE Range (6)	WR (7)	HRWR (8)	Slump Range (Inches)
A	0.60 max.	--	3.5 to 5	Yes	*	1-4
B	0.54 max.	--	2.5 to 5	Yes	*	1-3
C	0.44 max.	20 – 25%	2.5 to 5	Yes	*	3-5
D	0.40 max.	--	3.5 to 5	Yes	*	3-5

NOTES:
(1) Minimum compressive strength in psi at 28 days.
(2) ASTM designation.
(3) Size Number in ASTM C33/C33M.
(4) Cementitious content in pounds/cubic yard.
(5) W/C is Water-Cementitious ratio by weight.
(6) AE is percent air-entrainment.
(7) WR is water-reducer admixture.
(8) HRWR is high-range water-reducer admixture.
* HRWR used at the Contractor's option.

2.04 CONCRETE REINFORCEMENT

A. Reinforcing steel shall be deformed bars and shall comply with ASTM A615/A615M, Grade 60.

B. Welded wire fabric shall be flat sheet and comply with ASTM A1064/A1064M.

C. Fiber reinforcement shall be synthetic fibers with 100% polypropylene collated, fibrillated fibers and with a minimum tensile strength of 70 ksi. Fiber-reinforced concrete shall be in accordance with ASTM C1116/C1116M, Type III, Synthetic Fiber-Reinforced Concrete. Use a minimum of 1.5 pounds of fibers per cubic yard of concrete. Add fibers at the batch plant.

2.05 FORMS

A. Forms for cast-in-place concrete shall be made of wood, metal, or other approved material. All forms shall be designed and constructed to provide a flat, uniform concrete surface requiring minimal finish or repairs.

B. Forms shall be free from roughness and imperfections, substantially watertight, and adequately braced and tied to prevent motion when concrete is placed. No wooden spreaders will be allowed in the concrete.

C. The form-release agent shall be coated on all surfaces in contact with concrete using effective, non-staining, non-residual, water-based, bond-breaking form coatings.

D. Wire ties will not be allowed. Metal ties or anchorages necessary within the forms shall be so constructed that the metal work can be removed for a depth of at least

1 inch from the surface of the concrete without injury to such surface by spalling or otherwise. Forms shall be thoroughly cleaned before using and shall be treated with oil or other approved material.

E. All exposed edges of the finished concrete shall be chamfered 3/4 inch.

2.06 EXPANSION/CONTRACTION JOINTS

A. Pre-molded joint fillers for water holding structures shall be non-extruding and resilient non-bituminous type and comply with ASTM D1752, Type III. Joint fillers for sidewalk and roadway pavements shall be asphalt-impregnated fiber board conforming to ASTM D1751.

B. Joint sealants shall comply with ASTM D6690, Type M class 25 for horizontal surface, and ASTM C920, Type M grade NS class 25 for vertical surface greater than 3% slope.

C. Bond breaker shall be an adhesive-backed glazed butyl or polyethylene tape.

2.07 WATERSTOPS (NOT USED)

2.08 BONDING MATERIALS

A. The concrete bonding agent shall be an aqueous-phase, film-forming, non-oxidizing, freeze- and thaw-resistant compound agent suitable for brush or spray application conforming to ASTM C932.

B. Epoxy adhesive binder shall be two-component, epoxy-polysulfide polymer-type bind with amine-type curing agent conforming to ASTM C881/C881M, Type II.

2.09 VAPOR BARRIER

A. Vapor barrier shall be clear polyethylene sheeting, 6-mil conforming to ASTM D2103 or D4397.

2.10 GROUT

A. Non-shrink, cementitious grout shall comply with ASTM C1107/C1107M, Grade B or C.

B. Non-shrink, epoxy machinery grout shall conform to ASTM C827/C827M with compressive strength of 12,000 psi in 7 days.

C. Concrete grout shall have a compressive average strength of 3,000 psi at 29 days. Synthetic fiber reinforcing fibers shall be added to the grout mix at rate of 1.5 pounds of fiber per cubic yard of grout.

PART 3 EXECUTION

3.01 REINFORCING STEEL

A. Reinforcement shall be accurately fabricated to the dimensions shown. Bars shall be bent around a pin having a diameter not less than that recommended in ACI 318. All bars shall be bent cold.

B. Reinforcement shall be shipped to the work with bars of the same size and shape fastened in bundles with metal identification tags giving size and mark securely wired on. The identification tags shall be labeled with the same designation as shown on submitted bar schedules and shop drawings.

C. All bars shall be stored off the ground and shall be protected from moisture and be kept free from dirt, oil, or injurious coatings. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

D. Tension lap splices shall be provided at all laps in compliance with ACI 318. All bar splices shall be staggered wherever possible. When splicing bars of different diameters, the length of lap is based on the larger bar. Class B splices shall be used at all locations unless otherwise indicated on the Drawings.

E. Before being placed in position, reinforcement shall be thoroughly cleaned of loose mill and rust scale, dirt, and other coatings that reduce or destroy bond. Where there is delay in depositing concrete after reinforcement is in place, bars shall be reinspected and cleaned when necessary.

F. Reinforcement that is to be exposed for a considerable length of time after being placed shall be painted with a heavy coat of cement grout, if required.

G. In no case shall any reinforcing steel be covered with concrete until the number and position of the reinforcements have been checked by the Engineer and his/her permission given to proceed with the concreting.

3.02 MECHANICAL COUPLER SYSTEM

A. Use mechanical reinforcing steel coupling system only where indicated. Install in accordance with the manufacturer's written instructions and as specified in this Section.

B. Upon receiving the coupler system, obtain the threaded length for the male ends and sample each lot for variation in thread length on male ends. Record the amount of actual thread (per lot).

C. After formwork is removed, confirm cap is in position (female end).

D. Before installing the male end, remove screwed cap and confirm that the female end (coupler) is clean and free of concrete splatter, dirt, burrs, or other matter which may foul threads.

E. Tighten the dowel bar male end until the threads are fully engaged and no threads are exposed. Do not strip threads.

F. Visually inspect all splice locations. A correctly installed splice will show no exposed threads on the threaded splice bars.

3.03 CONCRETE MIXING AND TRANSPORTING

A. Concrete shall be ready-mixed concrete produced by equipment acceptable to the Engineer. No hand mixing will be permitted. Clean each transit mix truck drum and reverse drum rotation before the truck proceeds under the batching plant. Equip each transit mix truck with a continuous, nonreversible, revolution counter showing the number of revolutions at mixing speeds.

B. Ready mix concrete shall be transported to the site in watertight agitator or mixer trucks loaded not in excess of their rated capacities as stated on the name plate.

C. Keep the water tank valve on each transit truck locked at all times. Any addition of water must be directed by the Engineer. Added water shall be incorporated by additional mixing of at least 35 revolutions. All added water shall be metered and the amount of water added shall be shown on each delivery ticket.

D. All central plant and rolling stock equipment and methods shall comply with ACI 318 and ASTM C94/C94M.

E. Select equipment of size and design to ensure continuous flow of concrete at the delivery end. Metal or metal-lined non-aluminum discharge chutes shall be used and shall have slopes not more than 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 feet long and chutes not meeting slope requirements may be used if concrete is discharged into a hopper before distribution.

F. Re-tempering (mixing with or without additional cement, aggregate, or water) of concrete or mortar which has reached initial set will not be permitted.

G. Handle concrete from mixer to placement as quickly as practicable while providing concrete of required quality in the placement area. Dispatch trucks from the batching plant so they arrive at the work site just before the concrete is required, thus avoiding excessive mixing of concrete while waiting or delays in placing successive layers of concrete in the forms.

H. Furnish a delivery ticket for ready-mixed concrete to the Engineer as each truck arrives. Each ticket shall provide a printed record of the weight of cement and each aggregate as batched individually. Use the type of indicator that returns for zero punch or returns to zero after a batch is discharged. Clearly indicate the weight of fine and coarse aggregate, cement, and water in each batch; the quantity delivered; the time any water is added; and the numerical sequence of the delivery. Show the time of day batched and time of discharge from the truck. Indicate the number of revolutions of the truck mixer.

I. Temperature and Mixing Time Control

1. In cold weather, do not allow the as-mixed temperature of the concrete and concrete temperatures at the time of placement in the forms to drop below 40°F.

2. If the water or aggregate has been heated, combine the water with aggregate in the mixer before cement is added. Do not add cement to mixtures of water and aggregate when the temperature of the mixture is greater than 90°F.

3. In hot weather, cool ingredients before mixing to maintain temperature of the concrete below the maximum placing temperature of 90°F. If necessary, substitute well-crushed ice for all or part of the mixing water.

4. The maximum time interval between adding mixing water and/or cement to the batch and placing concrete in the forms shall not exceed the values shown in Table 2.

TABLE 2
MAXIMUM TIME TO DISCHARGE OF CONCRETE

Air or Concrete Temperature (whichever is higher)	Maximum Time
80 to 90°F (27 to 32°C)	45 minutes
70 to 79°F (21 to 26°C)	60 minutes
40 to 69°F (5 to 20°C)	90 minutes

J. If an approved high-range water-reducer (plasticizer) is used to produce plasticized concrete, the maximum time interval shall not exceed 90 minutes.

3.04 CONCRETE APPEARANCE

A. Concrete mix showing either poor cohesion or poor coating of the coarse aggregate with paste shall be remixed. If this does not correct the condition, the concrete shall be rejected.

B. Concrete for the work shall provide a homogeneous structure which, when hardened, will have the required strength, durability, and appearance. Mixtures and workmanship shall be such that concrete surfaces, when exposed, will require no finishing. When concrete surfaces are stripped, the concrete when viewed in good lighting from 10 feet away shall be pleasing in appearance and at 20 feet shall show no visible defects.

3.05 PLACING CONCRETE

A. Reinforcement, where required, shall be accurately placed in the exact positions shown, shall be secured against displacement with annealed iron wire ties or suitable clips at intersections, and shall have a clear space of 2 inches between the steel and face of forms unless otherwise indicated. Wire ties passing through the forms to hold the steel in proper position will not be allowed. Concrete blocks with wire ties cast in them may be used where approved by the Engineer to maintain the clearance between reinforcement and forms. Reinforcing bars shall be free from rust, scale, dirt, grease, and injurious contaminants.

B. No concrete shall be placed until the Engineer has approved forms and method of placement. Before concrete is deposited, all debris, foreign matter, dirt, and water shall be removed from the forms. The surface of concrete previously placed, such as manhole bases or horizontal construction joints, shall be cleaned and brushed with cement paste. Concrete shall not be placed in water or submerged within 24 hours after placing, nor shall running water be permitted to flow over the surface of fresh concrete within 4 days after its placing.

C. Deposit concrete as near its final position as possible to avoid segregation due to rehandling or flowing. Pumping of concrete will be permitted when an approved design mix and aggregate sizes, suitable for pumping, are used. Do not deposit concrete that has partially hardened or has been contaminated by foreign materials. If the section cannot be placed continuously, place construction joints as specified or as approved. Place concrete for walls using tremie tubes in 12- to 24-inch lifts, keeping the surface horizontal. Do not drop concrete more than 4 feet.

D. High-frequency mechanical vibrators shall be used to the extent necessary to obtain proper consolidation of the concrete. Care shall be taken to avoid segregating aggregates by excessive vibration. Concrete adjacent to forms and around pipe stubs shall be carefully spaded or rodded.

E. Concrete walls shall be deposited in one continuous operation with concrete brought up evenly on all sides. Chutes shall be of metal, "U" shaped, and provided with a baffle plate at the end, if necessary, to prevent segregation of materials. Chutes shall be placed at an angle of not less than 25 degrees, nor more than 45 degrees from horizontal and they shall be kept clean and free from hardened concrete.

F. No concrete shall be mixed or placed during freezing weather without explicit permission. When placing concrete when the air temperature is below 40ºF, heat the water, sand, and gravel so that the temperature of the concrete will be at least 50ºF. This temperature shall be maintained for 72 hours after placing.

3.06 FIELD TESTS

A. The Engineer will take sets of three field control cylinder specimens during the progress of the work, in compliance with ASTM C31/C31M. The number of sets of concrete test cylinders taken of each class of concrete placed each day shall not be fewer than one set nor fewer than one set for each 150 cubic yards of concrete nor fewer than one set for each 5,000 square feet of surface area for slabs or walls. One cylinder shall be broken at 7 days and two cylinders shall be broken and their strengths averaged at 28 days. When the average 28-day compressive strength of the cylinders in any set falls below the specified compressive strength or below proportional minimum 7-day strengths (where the proper relation between 7- and 28-day strengths has been established by tests), the Engineer may reject the concrete represented by the set of cylinders and may require modification of the concrete and/or require modification of the proportions, water content, or temperature conditions of the design mix to achieve the required strengths.

B. The Contractor shall cooperate in testing by allowing free access to the work for selecting samples, providing an insulated closed curing box for specimens, protecting the specimens against injury or loss through his/her operations, and furnishing material and labor required for taking concrete cylinder samples. All shipping of specimens will be paid for by the Owner.

C. Slump tests will be made in the field by the Engineer in conformity with ASTM C143/C143M.

D. Tests for air content shall be made in compliance with either the pressure method complying with ASTM C231/C231M or by the volumetric method complying with ASTM C173/C173M.

3.07 FORMED SURFACES

A. Forms shall remain in-place for the time specified in ACI MCP-4. Do not remove forms and shores until the concrete has gained sufficient strength to support its weight and superimposed loads.

B. Exercise care to prevent damaging edges or obliterating the lines of chamfers, rustications, or corners when removing the forms or performing any other work adjacent to such chamfers, rustications, or corners.

C. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete.

D. Rough Form Finish

1. Immediately after stripping forms and before the concrete has changed color, carefully remove all fins and projections.
2. Promptly fill holes left by tie cones and defects as specified.

3.08 FLOORS AND SLABS

A. Floated Finish

1. Machine Floating:

a. Screed slabs with straightedges to the established grades shown on the Drawings. Immediately after final screeding sprinkle a dry cement/sand shake in the proportion of two sacks of Portland cement to 350 pounds of coarse natural concrete sand evenly over the surface at the rate of approximately 500 pounds/1,000 square foot of slab. Do not sprinkle neat, dry cement on the surface.

b. The application of the cement/sand shake may be eliminated at the discretion of the Engineer if the base slab concrete exhibits adequate fattiness and homogeneity and the need is not indicated. When the concrete has hardened sufficiently to support the weight of a power float without the float's digging into or disrupting the level surface, thoroughly float the shake into the surface with a heavy revolving disc-type power compacting machine capable of providing a 200-pound compaction force distributed over a 24-inch-diameter disc.

c. Start floating along walls and around columns and then move systematically across the surface leaving a matte finish.

d. The compacting machine shall be the "Kelly Power Float with Compaction Control" as manufactured by Kelley Industries of SSP Construction Equipment Inc., Pomona, CA or equal. Troweling machines equipped with float (shoe) blades that are slipped over the trowel blades may be used for floating. Floating with a troweling machine equipped with normal trowel blades will not be permitted. The use of any floating or troweling machine which has a water attachment for wetting the concrete surface during finishing will not be permitted.

2. Hand Floating:

a. In lieu of power floating, small areas may be compacted by hand floating. The dry cement/sand shake previously specified shall be used unless specifically eliminated by the Engineer. Screed the slabs with straightedges to the established grades shown on the Drawings. While the concrete is still green but sufficiently hardened to support a finisher and kneeboards with no more than 1/4-inch indentation, wood float to a true, even plane with no coarse aggregate visible. Use sufficient pressure on the wood floats to bring moisture to the surface.

3. Finishing Tolerances:

a. Level slabs to a tolerance of plus or minus 1/8 inch when checked with a 10-foot straightedge placed anywhere on the slab in any direction. Failure to meet the above requirements shall be cause for removal, grinding, or other correction as directed by the Engineer.

B. Broom Finish

1. Screed slabs with straightedges to the established grades indicated on the Drawings. When the concrete has stiffened sufficiently to maintain small surface indentations, draw a stiff bristle broom lightly across the surface in the direction of drainage or, in the case of walks and stairs, perpendicular to the direction of traffic to provide a non-slip surface.

C. Steel Trowel Finish

1. Finish concrete as specified in Article 3.04. Then, hand steel trowel to a perfectly smooth, hard, even finish free from high or low spots or other defects.

D. Concrete Sealer

1. Prepare and seal surfaces indicated on the room finish schedule to receive a sealer as follows:

a. Finish concrete as specified in the preceding paragraphs and in accordance with the Schedule in Article 3.13.
b. Newly Placed Concrete: Surface must be sound and properly finished. Surface is application ready when it is damp but not wet and can no longer be marred by walking workmen.
c. Newly Cured Bare Concrete: Level any spots gouged out by trades. Remove all dirt, dust, droppage, oil, grease, asphalt, and foreign matter. Cleanse with caustics and detergents as required. Rinse thoroughly and allow to dry so that surface is no more than damp and not wet.
d. Aged Concrete: Restore surface soundness by patching, grouting, filling cracks and holes, etc. Surface must also be free of any dust, dirt, and other foreign matter. Use power tools and/or strippers to remove any incompatible sealers or coatings. Cleanse as required following the procedure indicated under cured concrete.
e. Methods: Apply sealer to form a continuous, uniform film by spray, soft bristle pushbroom, long nap roller, or lambswool applicator. Ordinary garden type sprayers, using neoprene hose, are recommended for best results.
f. Applications: For curing only, apply the first coat evenly and uniformly as soon as possible after final finishing at the rate of 200 to 400 square feet per gallon. Apply the second coat when all trades are completed and the structure is ready for occupancy at the rate of 400 to 600 square feet per gallon.
g. To meet guarantee and to seal and dustproof, two coats are required. For sealing new concrete, both coats shall be applied full strength. On aged concrete, when renovating, dustproofing, and sealing, the first coat should be thinned 10 to 15% with reducer in accordance with the manufacturer's directions.

3.09 CONCRETE RECEIVING CHEMICAL HARDENER (NOT USED)

3.10 APPROVAL OF FINISHES

A. All concrete surfaces, when finished, will be examined by the Engineer.

B. Surfaces which in the opinion of the Engineer are unsatisfactory shall be refinished or reworked.

C. After finishing horizontal surfaces, regardless of the finishing procedure specified, the concrete shall be cured in compliance with this Section unless otherwise directed by the Engineer.

1. Interior or Exterior Horizontal Concrete not Requiring Floor Hardener or Sealer: Floated finish. See Paragraph 3.08D.
2. Concrete for Exterior Walks and Interior and Exterior Stairs: Broomed finish perpendicular to direction of traffic. See Paragraph 3.08B.
3. Concrete Slabs On Which Process Liquids Flow or In Contact with Sludge: Steel trowel finish. See Paragraph 3.08C.

3.11 CURING AND PROTECTION

A. The Contractor shall protect all concrete work against injury from the elements and defacements of any nature during construction operations.

B. Curing Methods

1. Curing Methods for Concrete Surfaces: Cure concrete to retain moisture and maintain specified temperature at the surface for a minimum of 7 days after placement. Curing methods to be used are as follows:

a. Water Curing: Keep entire concrete surface wet by ponding, continuous sprinkling, or by covering with saturated burlap. Begin wet cure as soon as concrete attains an initial set and maintain wet cure 24 hours a day.
b. Sheet Material Curing: Cover entire surface with sheet material. Securely anchor sheeting to prevent wind and air from lifting the sheeting or entrapping air under the sheet. Place and secure sheet as soon as initial concrete set occurs.
c. Liquid Membrane Curing: Apply over the entire concrete surface except for surfaces to receive additional concrete. DO NOT place curing compound on any concrete surface where additional concrete is to be placed or where concrete sealers or surface coatings are to be used. Apply curing compound as soon as the free water on the surface has disappeared and no water sheen is visible, but not after the concrete is dry or when the curing compound can be absorbed into the concrete. Application shall be in compliance with the manufacturer's recommendations.

C. Finished surfaces and slabs shall be protected from the direct rays of the sun to prevent checking and crazing.

D. Cold Weather Concreting

1. *Cold weather* is defined as a period when the average daily outdoor temperature drops below 40°F for more than 3 successive days. The average daily temperature shall be calculated as the average of the highest and the lowest temperature during the period from midnight to midnight.

2. Cold weather concreting shall conform to ACI 306.1 and the additional requirements specified in this Section. Temperatures at the concrete placement shall be recorded at 12-hour intervals (minimum).

3. The Contractor shall discuss a cold weather work plan with the Engineer. The discussion shall encompass the methods and procedures proposed for use during cold weather, including the production, transportation, placement, protection, curing, and temperature monitoring of the concrete. The procedures to be implemented upon abrupt changes in weather conditions or equipment failures shall also be discussed. Cold weather concreting shall not begin until the work plan is acceptable to the Engineer.

4. During periods of cold weather, concrete shall be protected to provide continuous warm, moist curing (with supplementary heat when required) for a total of at least 350 degree-days of curing.

    a. *Degree-days* are defined as the total number of 24-hour periods multiplied by the weighted average daily air temperature at the surface of the concrete (e.g., 5 days at an average of 70°F = 350 degree-days).
    b. To calculate the weighted average daily air temperature, sum hourly measurements of the air temperature in the shade at the surface of the concrete taking any measurement less than 50°F as 0°F. Divide the sum thus calculated by 24 to obtain the weighted average temperature for that day.

5. Salt, manure, or other chemicals shall not be used for protection.

6. The protection period for concrete being water cured shall not be terminated during cold weather until at least 24 hours after water curing has been terminated.

E. Hot Weather Concreting

1. *Hot weather* is defined as any combination of high air temperatures, low relative humidity, and wind velocity which produces a rate of evaporation

estimated in accordance with ACI 305R, approaching or exceeding 0.2 pound/square foot/hour).

2. Concrete placed during hot weather shall be batched, delivered, placed, cured, and protected in compliance with the recommendations of ACI 305R and the additional requirements specified in this Section.

    a. Temperature of concrete being placed shall not exceed 90°F and every effort shall be made to maintain a uniform concrete mix temperature below this level. The temperature of the concrete shall be such that it will cause no difficulties from loss of slump, flash set, or cold joints.
    b. All necessary precautions shall be taken to deliver the concrete promptly, to place the concrete promptly upon its arrival at the job, and to provide vibration immediately after placement.
    c. The Engineer may direct the Contractor to immediately cover plastic concrete with sheet material.

3. The Contractor shall discuss with the Engineer a work plan describing the methods and procedures proposed to use for concrete placement and curing during hot weather. Hot weather concreting shall not begin until the work plan is acceptable to the Engineer.

3.12 STRIPPING AND FINISHING CONCRETE

A. Forms shall not be stripped before the concrete has attained a strength of at least 30% of the specified design strength, unless otherwise approved by the Engineer. This is equivalent to approximately "100 day-degrees" of moist curing.

B. Shores shall not be removed until the concrete has attained at least 70% of its specified design strength and also sufficient strength to support safely its own weight and construction live loads.

C. Care shall be exercised to prevent damaging edges or obliterating the lines of chamfers, rustications, or corners when removing the forms or doing any other adjacent work.

D. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete to the satisfaction of the Engineer.

E. As soon as forms have been stripped, remove form ties, if employed, and fill the recess to ensure complete watertightness. Chip out and repair any defects in the surface of the walls in a workmanlike manner. Defective concrete where it occurs shall be cut to a minimum depth of 1 inch, thoroughly roughened, and neat

cement brushed in. The hole shall then be filled with mortar in the proportion of 1 part cement and 2-1/2 parts sand with a minimum of water. Mortar for filling form tie recesses shall be mixed to a slightly damp consistency (just short of "balling"), pressed into the recess until dense, and troweled smooth. Mortar in larger patches shall be applied and allowed to assume a partial set following which it shall be struck off flush with the adjoining surface. Patches shall be kept moist for several days to ensure proper curing.

F. Top surface of slabs shall be screeded to the established grades and shall be a true plane with a tolerance of 1/8 inch when checked with a 10-foot straightedge. The surface shall be finished to give a smooth, hard, even surface free from high or low spots or other defects. Failure to meet the condition shall be cause for removal, grinding, or other correction as directed by the Engineer.

G. Concrete to receive Liner System shall be finished in strict accordance with the manufacturer's recommendations.

3.13 SCHEDULE

A. The following (Table 3) are the general applications for the various concrete classes and design strengths:

TABLE 3
CONCRETE SCHEDULE

Class	Design Strength (psi)	Description
A	2,500	Concrete fill and duct encasement.
B	3,000	Concrete overlay slabs and curbs/pavements.
C	4,000	Slabs on grade, precast lids, and all other structural concrete.
D	5,000	Prestressed concrete.

3.14 MISCELLANEOUS WORK

A. Sleeve steel work required to be set in the concrete forms for attachment of structural and miscellaneous equipment shall be set or installed under this Division. The Contractor shall be fully responsible for the setting of such materials in the forms and shall correct all such materials not installed in a proper location or manner at his own expense.

END OF SECTION

DIVISION 5

METALS

SECTION 05500
METAL FABRICATIONS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes the following:

1. Metal ladders.
2. Ladder safety cages.
3. Metal bollards.
4. Loose bearing and leveling plates.
5. Shelf and relieving angles.
6. Miscellaneous framing and supports.
7. Prefabricated steel building columns.
8. Steel channels for overhead door openings.
9. Stair nosings.
10. Loose steel lintels.
11. Gratings.
12. Access hatches.

B. Products furnished, but not installed, under this Section include the following:

1. Anchor bolts, steel pipe sleeves, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product Data: For the following:

1. Non-slip aggregates and non-slip-aggregate surface finishes.
2. Prefabricated building columns.
3. Metal nosings and treads.
4. Paint products.
5. Grout.

B. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
2. Provide templates for anchors and bolts specified for installation under other Sections.
3. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Verification: For each type and finish of extruded nosing.

D. Mill Certificates: Signed by the manufacturers of stainless-steel sheet certifying that products furnished comply with requirements.

E. Welding certificates.

F. Qualification Data: Florida Professional Engineering Registration certificate.

1.03 WORK SEQUENCE

A. The Contractor shall coordinate the installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to the Project site in time for installation.

B. The Contractor shall coordinate the installation of steel weld plates and angles for casting into concrete that are specified in this Section but required for work of another Section. Deliver such items to the Project site in time for installation.

1.04 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American National Standards Institute (ANSI)

1. ANSI A14.3—Ladders – Fixed – Safety Requirements.

B. American Society for Testing and Materials (ASTM)

1. ASTM A27/A27M—Standard Specification for Steel Castings, Carbon, for General Application.
2. ASTM A36/A36M—Standard Specification for Carbon Structural Steel.
3. ASTM A47/A47M—Standard Specification for Ferritic Malleable Iron Castings.
4. ASTM A48/A48M—Standard Specification for Gray Iron Castings.
5. ASTM A53/A53M—Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
6. ASTM A123/A123M—Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
7. ASTM A153/A153M—Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
8. ASTM A276/A276M—Standard Specification for Stainless Steel Bars and Shapes.
9. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
10. ASTM A489—Standard Specification for Carbon Steel Lifting Eyes.
11. ASTM A500/A500M—Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
12. ASTM A563—Standard Specification for Carbon and Alloy Steel Nuts.
13. ASTM A653/A653M—Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
14. ASTM A666—Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
15. ASTM A780/A780M—Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
16. ASTM A786/A786M—Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
17. ASTM B108/B108M—Standard Specification for Aluminum-Alloy Permanent Mold Castings.
18. ASTM B209—Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
19. ASTM B221—Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
20. ASTM B241/B241M—Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
21. ASTM B633—Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
22. ASTM C1107/C1107M—Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

23. ASTM D1187/D1187M—Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
24. ASTM E488/E488M—Standard Test Methods for Strength of Anchors in Concrete Elements.
25. ASTM F436/F436M—Standard Specification for Hardened Steel Washers.
26. ASTM F593—Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
27. ASTM F594—Standard Specification for Stainless Steel Nuts.
28. ASTM F836M—Standard Specification for Style 1 Stainless Steel Metric Nuts (Metric).
29. ASTM F879—Standard Specification for Stainless Steel Socket Button and Flat Countersunk Head Cap Screws.
30. ASTM F1554—Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
31. ASTM F3125/F3125M—Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1,040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.

C. American Society of Mechanical Engineers (ASME)

1. ASME B18.2.1—Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series).
2. ASME B18.2.3.8M—Metric Hex Lag Screws.
3. ASME B18.6.1—Wood Screws (Inch Series).
4. ASME B18.6.3—Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch Series).
5. ASME B18.6.7M—Metric Machine Screws.
6. ASME B18.21.1—Washes: Helical Spring-Lock, Tooth Lock, and Plain Washers (Inch Series).
7. ASME B18.21.2M—Lock Washers (Metric Series).
8. ASME B18.22.1—Plain Washers.
9. ASME B18.22M—Metric Plain Washers.

D. American Welding Society (AWS)

1. AWS D1.1/D1.1M—Structural Welding Code – Steel.
2. AWS D1.2/D1.2M—Structural Welding Code – Aluminum.
3. AWS D1.3/D1.3M—Structural Welding Code – Sheet Steel.
4. AWS D1.6/D1.6M—Structural Welding Code – Stainless Steel.

E. Environmental Protection Agency (EPA)

1. EPA Method 24—Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings.

F. Federal Regulations (FR)

1. 40 CFR 59—National Volatile Organic Compound Emission Standards for Consumer and Commercial Products.

G. National Association of Architectural Metal Manufacturers (NAAMM)

1. NAAMM MBG 531—Metal Bar Grating Manual.

H. Society for Protection Coatings (SSPC)

1. SSPC-PA1—Shop, Field, and Maintenance Painting of Steel.
2. SSPC-SP6/NACE No. 3—Commercial Blast Cleaning.
3. SSPC-SP10/NACE No. 2—Near-White Blast Cleaning.
4. SSPC-Paint 20—Zinc-Rich Primers Type I Inorganic and Type II Organic.
5. SSPC-Paint 29—Zinc Dust Sacrificial Primer, Performance-Based.
6. SSPC-Zone 1A—Interior, Normally Dry.
7. SSPC-Zone 1B—Exterior, Normally Dry.

I. Specialty Steel Industry of North America (SSINA)

1. SSINA No. 6 Finish—Satin Finish.

1.05 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, Structural Welding Code—Steel.
2. AWS D1.2/D1.2M, Structural Welding Code—Aluminum.
3. AWS D1.3/D1.3M, Structural Welding Code—Sheet Steel.
4. AWS D1.6/D1.6M, Structural Welding Code—Stainless Steel.

1.06 PROJECT REQUIREMENTS

A. Structural Performance of Ladders: The Contractor shall provide ladders capable of withstanding the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.

B. Thermal Movements: Provide exterior metal fabrications that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120°F, ambient; 180°F, material surfaces.

1.07 PROJECT CONDITIONS

A. Field Measurements: The Contractor shall verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on shop drawings.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
2. Provide allowance for trimming and fitting at site.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 Articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include but are not limited to products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include but are not limited to manufacturers specified.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.02 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For metal fabrications exposed to view in the completed

Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.03 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

1. Unless noted otherwise, steel that is not stainless steel shall be galvanized with a G90 coating conforming to ASTM A123/A123M.

B. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666, Type 316L.

C. Stainless-Steel Bars and Shapes: ASTM A276/A276M, Type 316L.

D. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.

E. Steel Pipe: ASTM A53/A53M, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

2.04 ALUMINUM ALLOY PRODUCTS

A. Aluminum Sheet Plates: Conforming to ASTM B209.
B. Aluminum Extrusions: Conforming to ASTM B221.
C. Aluminum Castings: Conforming to ASTM B108/B108M.

2.05 FASTENERS

A. General: For all exterior applications and where fastening aluminum, provide Type 304 stainless-steel fasteners. Provide hot-dipped galvanized fasteners in all other applications in accordance with ASTM A153/A153M unless noted otherwise on the Drawings. Select fasteners for type, grade, and class required.

B. High-Strength Bolts and Nuts: ASTM F3125/F3125M with heavy hex nuts ASTM A563 and hardened carbon-steel washers ASTM F436/F486M.

C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A (Property Class 4.6); with hex nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.

D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, nuts, and flat washers; ASTM F593 for bolts and ASTM F594 for nuts, Alloy Group A4.

E. Stainless Steel Socket Button and Flat Countersunk Head Cap Screws: ASTM F879.

F. Anchor Bolts: ASTM F 1554, Grade 36.

G. Eyebolts: ASTM A489.

H. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).

I. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

J. Wood Screws: Flat head, ASME B18.6.1.

K. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M).

L. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M).

M. Cast-in-Place Anchors in Concrete: Anchors capable of sustaining without failure a load equal to four times the load imposed, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.

1. Threaded or wedge type; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized in accordance with ASTM A153/A153M.

N. Expansion Anchors: Anchor bolt and sleeve assembly with ability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M conducted by a qualified independent testing agency.

1. Material for Anchors in Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633, Class Fe/Zn 5.
2. Material for Anchors in Exterior Locations: Alloy Group (A4) stainless-steel bolts complying with ASTM F593 and nuts complying with ASTM F594 (ASTM F836M).

2.06 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Shop Primers: Provide primers that comply with Division 9, Finishes.

C. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.

1. Use primer with a VOC content of 3.5 pounds/gallon or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Available Products:

a. Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.
b. Carboline Company; Carbozinc 621.
c. ICI Devoe Coatings; Catha-Coat 313.
d. International Coatings Limited; Interzinc 315 Epoxy Zinc-Rich Primer.
e. PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.
f. Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.
g. Tnemec Company, Inc.; Tneme-Zinc 90-97.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

E. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

F. Nonshrink, Metallic Grout: Factory-packaged, ferrous-aggregate grout complying with ASTM C1107/C1107M, specifically recommended by the manufacturer for heavy-duty loading applications.

G. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by the manufacturer for interior and exterior applications.

2.07 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to the greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work true to line and level with accurate angles, surfaces, and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that will be exposed to weather so as to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of the type indicated and coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 inch by 1-1/2 inches with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.08 METAL BOLLARDS

A. Steel Pipe Bollards: Fabricate pipe bollards from Schedule 80 steel pipe. Fill bollards with concrete.

1. Where bollards are indicated to receive push-button controls for door operators, provide necessary cutouts for push-button controls and hole for wire.

B. Fabricate bollards with 3/8-inch-thick steel base plates for bolting to concrete slab. Drill baseplates at all four corners for 3/4-inch anchor bolts.

1. Where bollards are to be anchored to sloping concrete slabs, angle baseplates for plumb alignment of bollards.

C. Fabricate sleeves for bollard anchorage from steel pipe or tubing with 1/4-inch-thick steel plate welded to bottom of sleeve. Make sleeves not less than 8 inches deep and 3/4 inch larger than OD of bollard.

D. Fabricate internal sleeves for removable bollards from Schedule 40 steel pipe or 1/4-inch wall-thickness steel tubing with an OD approximately 1/16 inch less than ID of bollards. Match drill sleeve and bollard for 3/4-inch steel machine bolt.

2.09 MISCELLANEOUS METAL FABRICATIONS

A. Loose Bearing and Leveling Plates: Flat, free from warps or twists, and of the required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.

B. Miscellaneous Framing and Supports

1. Provide steel framing and supports for applications indicated that are not a part of structural steel framework as required to complete the Work.
2. Fabricate units to sizes, shapes, and profiles indicated and required to receive other adjacent construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items.
3. Galvanize miscellaneous framing and supports in all locations.

2.10 FINISHES, GENERAL

A. Comply with NAAMM's *Metal Finishes Manual for Architectural and Metal Products* for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.11 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

1. ASTM A123/A123M, for galvanizing steel and iron products.
2. ASTM A153/A153M, for galvanizing steel and iron hardware.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Exteriors (SSPC Zone 1B) and Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3.
2. Interiors (SSPC Zone 1A): SSPC-SP 10.

C. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1 for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.12 STAINLESS STEEL FINISHES

A. Remove tool and die marks and stretch lines or blend into finish.

B. Dull Satin Finish: SSINA No. 6 Finish.

C. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 EXECUTION

3.01 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

3.02 INSTALLING METAL BOLLARDS

A. Anchor bollards to existing construction with anchor bolts. Provide four 3/4-inch bolts at each bollard, unless otherwise indicated.

1. Embed anchor bolts at least 4 inches in concrete.

B. Anchor bollards in concrete in formed or core-drilled holes not less than 8 inches deep and 3/4 inch larger than OD of bollard. Fill annular space around bollard solidly with nonshrink, nonmetallic grout mixed and placed to comply with the grout manufacturer’s written instructions. Slope grout up approximately 1/8 inch toward bollard.

C. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches above the bottom of the excavation. Place concrete and vibrate or

tamp for consolidation. Support and brace bollards in position until the concrete has cured.

D. Anchor internal sleeves for removable bollards in formed or core-drilled holes not less than 8 inches deep and 3/4 inch larger than OD of sleeve. Fill annular space around internal sleeves solidly with nonshrink, nonmetallic grout; mixed and placed to comply with grout manufacturer's written instructions. Slope grout up approximately 1/8 inch toward internal sleeve.

E. Anchor internal sleeves for removable bollards in place with concrete footings. Center and align sleeves in holes 3 inches above the bottom of the excavation. Place concrete and vibrate or tamp for consolidation. Support and brace sleeves in position until concrete has cured.

F. Place removable bollards over internal sleeves and secure with 3/4-inch machine bolts and nuts. After tightening nuts, drill holes in bolts for inserting padlocks. The Owner will furnish padlocks.

G. Fill bollards solidly with concrete, mounding top surface to shed water.

1. Do not fill removable bollards with concrete.

3.03 INSTALLING BEARING AND LEVELING PLATES

A. The Contractor shall clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean the bottom surface of bearing plates.

B. Set loose leveling and bearing plates on wedges or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if they are protruding cut off flush with the edge of the bearing plate before packing with grout.

1. Use non-shrink, metallic grout in concealed locations where not exposed to moisture; use non-shrink, nonmetallic grout in exposed locations, unless otherwise indicated.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.04 ADJUSTING AND CLEANING

The Contractor shall do the following:

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9, Finishes.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION

DIVISION 9

FINISHES

SECTION 09900
PAINTING AND COATING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes materials for and application of painting and coating systems for the following surfaces:

1. Buried metal.
2. PVC.

B. It does not include coating steel water tanks and reservoirs.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. Submit manufacturer's data sheets showing the following information:

1. Percent solids by volume.
2. Minimum and maximum recommended dry-film thickness per coat for prime, intermediate, and finish coats.
3. Recommended surface preparation.
4. Recommended thinners.
5. Statement verifying that the specified prime coat is recommended by the manufacturer for use with the specified intermediate and finish coats.
6. Application instructions including recommended equipment and temperature limitations.
7. Curing requirements and instructions.

C. Submit color swatches.

D. Submit certificate identifying the type and gradation of abrasives used for surface preparation.

E. Submit material safety data sheets for each coating.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM A780/A780M—Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
2. ASTM C501—Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser.
3. ASTM D520—Standard Specification for Zinc Dust Pigment.
4. ASTM D522/D522M—Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
5. ASTM D1002—Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal).
6. ASTM D2240—Standard Test Method for Rubber Property—Durometer Hardness.
7. ASTM D2697—Standard Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings.
8. ASTM D2794—Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
9. ASTM D3734—Standard Specification for High-Flash Aromatic Naphthas.
10. ASTM D4060—Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
11. ASTM D4138—Standard Practices for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive, Cross-Sectioning Means.
12. ASTM D4258—Standard Practice for Surface Cleaning Concrete for Coating.
13. ASTM D4260—Standard Practice for Liquid and Gelled Acid Etching of Concrete.
14. ASTM D4261—Standard Practice for Surface Cleaning Concrete Masonry Units for Coating.
15. ASTM D4263—Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
16. ASTM D4787—Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates.

17. ASTM D6386—Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
18. ASTM D7091—Standard Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals.
19. ASTM E84—Standard Test Method for Surface Burning Characteristics of Building Materials.

B. American Water Works Association (AWWA)

1. AWWA C203—Coal-Tar Protective Coatings and Linings for Steel Water Pipe.
2. AWWA C209—Tape Coatings for Steel Water Pipe and Fittings.

C. International Concrete Repair Institute (ICRI)

1. ICRI CSP 3-5—Light to Medium-Heavy Shotblast.
2. ICRI CSP 5—Medium-Heavy Shotblast.

D. National Association of Corrosion Engineers International (NACE)

1. NACE No. 6—Surface Preparation of Concrete.
2. NACE SP0188—Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.

E. NSF International (NSF)

1. NSF 61/600—Drinking Water System Components – Health Effects.

F. Steel Structure Painting Council (SSPC)

1. SSPC PA-1—Shop, Field, and Maintenance Coating of Metals.
2. SSPC PA-2—Procedure for Determining Conformance to Dry Coating Thickness Requirements.
3. SSPC SP-1—Solvent Cleaning.
4. SSPC SP-2—Hand Tool Cleaning.
5. SSPC SP-3—Power Tool Cleaning.
6. SSPC SP-5/NACE No. 1—White Metal Blast Cleaning.
7. SSPC SP-6/NACE No. 3—Commercial Blast Cleaning.
8. SSPC SP-7/NACE No. 4—Brush-Off Blast Cleaning.
9. SSPC SP-8—Pickling.

10. SSPC SP-10/NACE No. 2—Near-White Metal Wet Abrasive Blast Cleaning.
11. SSPC SP-11—Power-Tool Cleaning to Bare Metal.
12. SSPC SP WJ-1—Waterjet Cleaning of Metals – Clean to Bare Substrate.
13. SSPC SP WJ-2—Waterjet Cleaning of Metals – Very Thorough Cleaning.
14. SSPC SP WJ-3—Waterjet Cleaning of Metals – Thorough Cleaning.
15. SSPC SP WJ-4—Waterjet Cleaning of Metals – Light Cleaning.

G. U.S. Department of Defense (MIL)

1. MIL-C-18480B—Coating Compound, Bituminous, Solvent, Coal-Tar Base.
2. MIL-DTL-5541F—Chemical Conversion Coatings on Aluminum and Aluminum Alloys.
3. MIL-P-21035B—Paint High Zinc Dust Content, Galvanizing Repair.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 MATERIALS

2.01 PAINTING AND COATING SYSTEMS

The following index lists the various painting and coating systems by service and generic type:

PAINT COATINGS SYSTEM INDEX		
No.	Title	Generic Coating
Buried Metal Coating Systems		
21.	Buried Metal	Epoxy
24.	Buried Metal	Corrosion-resisting grease
PVC Coating System		
41.	PVC, Ultraviolet Exposure or Color Coding	Polyurethane

These systems are specified in detail in the following Paragraphs. For each coating, the required surface preparation, prime coat, intermediate coat (if required), topcoat, and coating thicknesses are described. Mil thicknesses shown are minimum dry-film thicknesses.

A. Buried Metal Coating Systems

1. System No. 21—Buried Metal:

a. Type: High solids Cycloaliphatic Amine epoxy or phenolic epoxy having minimum volume solids of 80% (ASTM D2697).
b. Service Conditions: Buried metal, such as valves, flanges, bolts, nuts, structural steel, and fittings.
c. Surface Preparation: Solvent clean in accordance with SSPC SP-1 to remove contaminants from the surface. Abrasive blast in accordance with SSPC SP-10.
d. Coating System: Apply three or more coats of Ameron 400; Tnemec 104 HS (6.0 to 8.0 mils per coat); ICI Devoe Bar-Rust 233H; Carboline 890LT; Sherwin-Williams Tank Clad HS B62-80 Series/B60V80 Series at 5.0 to 8.0 mils/coat or equal; 30 mils total. Maximum thickness of an individual coating shall not exceed the manufacturer's recommendation.

2. System No. 24—Buried Metal:

a. Type: Corrosion-resisting grease.
b. Service Conditions: Buried metal, such as bolts, bolt threads, tie rods, and nuts.
c. Surface Preparation: Solvent clean in accordance with SSPC SP-1 to remove contaminants from the surface. Power tool clean in accordance with SSPC SP-3 as a minimum. Abrasive blasting in accordance with SSPC-SP-6/NACE No. 3 is preferred.
d. Coating: NO-OX-ID GG-2 as manufactured by Sanchem, Inc. Apply to a minimum thickness of 1/4 inch.

B. PVC Coating System

1. System No. 41—PVC, Ultraviolet Exposure or Color Coding:

a. Type: Epoxy primer with minimum volume solids of 54% and a pigmented polyurethane enamel having a minimum volume solids of 66%.

b. Service Conditions: Color coding of PVC or exposed to sunlight.
c. Surface Preparation: Clean the surface per SSPC SP-1, Solvent Cleaning. Then, lightly abrade the surface with medium-grain sandpaper.
d. Prime Coat: One coat of Tnemec Series N69 Epoxoline; International 7510; Ameron 385; ICI Devoe Devran 224 HS; Sherwin-Williams Macropoxy 646 B58 Series/B58V600 at 5.0 to 8.0 mils DFT; Carboline 888 or 890; PPG PITT-GUARD® Direct-to-Rust Epoxy Mastic Coating 97-145 Series; or equal. Apply to a minimum dry-film thickness of 4 mils.
e. Finish Coat: One coat of Tnemec Series 1075; International Interthane 990HS; Ameron 450 HS; ICI Devoe Devran 379; Carboline 134 HG; Sherwin-Williams Hi-Solids Polyurethane B65-300 Series/B60V30 at 3.0 to 4.0 mils DFT; PPG PITTHANE® Ultra-Gloss Urethane Enamel 95-812 Series; or equal. Apply to a minimum dry-film thickness of 3 mils.

C. Abrasives for Surface Preparation

1. Abrasives used for preparation of ferrous (excluding stainless steel) surfaces shall be one of the following:

a. 16- to 30- or 16- to 40-mesh silica sand or mineral grit.
b. 20- to 40-mesh garnet.
c. Crushed iron slag, 100% retained on No. 80 mesh.
d. SAE Grade G-40 or G-50 iron or steel grit.

2. Abrasives used for preparation of stainless steel surfaces shall be 20- to 40-mesh silicon carbide or aluminum oxide.

3. Abrasives used for preparation of concrete and masonry surfaces shall be 16- to 30- or 16- to 40-mesh silica sand.

4. In the above gradations, 100% of the material shall pass through the first stated sieve size and 100% shall be retained on the second stated sieve size.

PART 3 EXECUTION

3.01 WEATHER CONDITIONS

A. Do not paint in the rain, wind, snow, mist, or fog or when steel or metal surface temperatures are less than 5°F above the dew point.

B. Do not apply paint when the relative humidity is above 85%.

C. Do not paint when temperature of metal to be painted is above 120°F.

D. Do not apply alkyd, inorganic zinc, silicone aluminum, or silicone acrylic paints if air or surface temperature is below 40°F or expected to be below 40°F within 24 hours.

E. Do not apply epoxy, acrylic latex, and polyurethane paints on an exterior or interior surface if air or surface temperature is below 60°F or expected to drop below 60°F in 24 hours.

3.02 SURFACE PREPARATION PROCEDURES

A. Remove oil and grease from metal surfaces in accordance with SSPC SP-1. Use clean cloths and cleaning solvents and wipe dry with clean cloths. Do not leave a film or greasy residue on the cleaned surfaces before abrasive blasting. Powerwashing with a biodegradable degreaser is also acceptable.

B. Remove weld spatter and weld slag from metal surfaces and grind smoothly rough welds, beads, peaked corners, and sharp edges including erection lugs in accordance with SSPC SP-2 and SSPC SP-3. Grind 0.020 inch (minimum) off the weld caps on pipe weld seams. Grind outside sharp corners, such as the outside edges of flanges, to a minimum radius of 1/4 inch.

C. Do not abrasive blast or prepare more surface area in one day than can be coated in one day; prepare surfaces and apply coatings the same day. Remove sharp edges, burrs, and weld spatter. Prime all areas before rust bloom forms and within the same day.

D. Do not abrasive blast PVC piping or equipment. Do not abrasive blast epoxy- or enamel-coated pipe that has already been factory coated, except to repair scratched or damaged coatings.

E. For carbon steel, do not touch the surface between the time of abrasive blasting and the time the coating is applied. Apply coatings within 2 hours of blasting or before any rust bloom forms.

F. Surface preparation shall conform to the SSPC specifications as follows:

Solvent Cleaning	SP-1
Hand Tool Cleaning	SP-2
Power Tool Cleaning	SP-3
White Metal Blast Cleaning	SP-5
Commercial Blast Cleaning	SP-6

Brush-Off Blast Cleaning	SP-7
Pickling	SP-8
Near-White Blast Cleaning	SP-10
Power Tool Cleaning to Bare Metal	SP-11
Surface Preparation of Concrete	SP-13
Waterjet Cleaning of Metals – Clean to Bare Substrate	SP WJ-1
Waterjet Cleaning of Metals – Very Thorough Cleaning	SP WJ-2
Waterjet Cleaning of Metals – Thorough Cleaning	SP WJ-3
Waterjet Cleaning of Metals – Light Cleaning	SP WJ-4

G. Wherever the words "solvent cleaning," "hand tool cleaning," "wire brushing," or "blast cleaning" or similar words are used in these Specifications or in the paint manufacturer's specifications, they shall be understood to refer to the applicable SSPC (Steel Structure Painting Council), surface preparation specifications listed above.

H. *Dust blasting* is defined as cleaning the surface through the use of very fine abrasives, such as siliceous or mineral abrasives, 80 to 100 mesh. Apply a fine etch to the metal surface to clean the surface of any contamination or oxide and to provide a surface profile for the coating.

I. *Brush-off blasting* of concrete and masonry surfaces is defined as opening subsurface holes and voids and etching the surface for a coating to bond.

J. For carbon steel surfaces, after abrasive blast cleaning, the height of the surface profile shall be 2 to 3 mils. Verify the surface profile by measuring with an impresser tape acceptable to the Owner's Representative. Perform a minimum of one test per 100 square feet of surface area. Testing shall be witnessed by the Owner's Representative. The impresser tape used in the test shall be permanently marked with the date, time, and locations where the test was made. Test results shall be promptly presented to the Owner's Representative.

K. Do not apply any part of a coating system before the Owner's Representative has reviewed the surface preparation. If coating has been applied without this review, if directed by the Owner's Representative, remove the applied coating by abrasive blasting and reapply the coat in accordance with this Specification.

3.03 ABRASIVE BLAST CLEANING

A. Use dry abrasive blast cleaning for metal surfaces. Do not use abrasives in automatic equipment that have become contaminated. When shop or field blast cleaning with handheld nozzles, do not recycle or reuse blast particles.

B. After abrasive blast cleaning and before coating is applied, dry clean surfaces to be coated by dusting, sweeping, and vacuuming to remove residue from blasting.

Apply the specified primer or touch-up coating within an 8-hour working day. Do not apply coating over damp or moist surfaces. Reclean any blast-cleaned surface not coated within the 8-hour period before applying primer or touch-up coating.

C. Keep the area of the work in a clean condition and do not permit blasting particles to accumulate and constitute a nuisance or hazard.

D. During abrasive blast cleaning, prevent damage to adjacent coatings. Schedule blast cleaning and coating so that dust, dirt, blast particles, old coatings, rust, mill scale, etc., will not damage or fall upon wet or newly coated surfaces.

3.04 COATING STAINLESS STEEL

A. Solvent clean in accordance with SSPC SP-1. Solvents and cleaning solutions shall contain less than 200 mg/l of halogens. Then abrasive blast to give a surface profile of 2.0 to 3.0 mils. Refer to the coatings for the correct surface profile. Use coatings that are low in chloride content.

B. Do not apply inorganic zinc primers to stainless steel if such primers are specified in the painting system required. Apply only the intermediate and finish coats in such cases.

3.05 PROCEDURES FOR ITEMS HAVING SHOP-APPLIED PRIME COATS

A. After applying primer to surfaces, allow coating to cure for a minimum of 2 hours before handling to minimize damage.

B. When loading for shipment to the project site, use spacers and other protective devices to separate items to prevent damaging the shop-primed surfaces during transit and unloading. If wood spacers are used, remove wood splinters and particles from the shop-primed surfaces after separation. Use padded chains or ribbon binders to secure the loaded items and minimize damage to the shop-primed surfaces.

C. Cover shop-primed items 100% with protective coverings or tarpaulins to prevent deposition of road salts, fuel residue, and other contaminants in transit.

D. Handle shop-primed items with care during unloading, installation, and erection operations to minimize damage. Do not place or store shop-primed items on the ground or on top of other work unless the ground or work is covered with a protective covering or tarpaulin. Place shop-primed items above the ground upon platforms, skids, or other supports.

3.06 PAINTING SYSTEMS

A. All materials of a specified painting system, including primer, intermediate, and finish coats, shall be produced by the same manufacturer. Thinners, cleaners, driers, and other additives shall be as recommended by the paint manufacturer for the particular coating system.

B. Deliver paints to the jobsite in the original, unopened containers.

3.07 PAINT STORAGE AND MIXING

A. Store and mix materials only in areas designated for that purpose by the Owner's Representative. The area shall be well ventilated, with precautionary measures taken to prevent fire hazards. Post "No Smoking" signs. Storage and mixing areas shall be clean and free of rags, waste, and scrapings. Tightly close containers after each use. Store paint at an ambient temperature from 50°F to 100°F.

B. Prepare multiple-component coatings using all of the contents of the container for each component as packaged by the paint manufacturer. Do not use partial batches. Do not use multiple-component coatings that have been mixed beyond their pot life. Provide small quantity kits for touch-up painting and for painting other small areas. Mix only the components specified and furnished by the paint manufacturer. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.

3.08 PROCEDURES FOR THE APPLICATION OF COATINGS

A. Conform to the requirements of SSPC PA-1. Follow the recommendations of the coating manufacturer, including the selection of spray equipment, brushes, rollers, cleaners, thinners, mixing, drying time, temperature and humidity of application, and safety precautions.

B. Stir, strain, and keep coating materials at a uniform consistency during application. Power mix components. For multiple component materials, premix each component before combining. Apply each coating evenly, free of brush marks, sags, runs, and other evidence of poor workmanship. Use a different shade or tint on succeeding coating applications to indicate coverage where possible. Finished surfaces shall be free from defects or blemishes.

C. Do not use thinners unless recommended by the coating manufacturer. If thinning is allowed, do not exceed the maximum allowable amount of thinner per gallon of coating material. Stir coating materials at all times when adding thinner. Do not flood the coating material surface with thinner before mixing. Do not reduce

coating materials more than is absolutely necessary to obtain the proper application characteristics and to obtain the specified dry-film thicknesses.

D. Remove dust, blast particles, and other debris from blast cleaned surfaces by dusting, sweeping, and vacuuming. Allow ventilator fans to clean airborne dust to provide good visibility in working area before applying coating. Remove dust from coated surfaces by dusting, sweeping, and vacuuming before applying succeeding coats.

E. Apply coating systems to the specified minimum dry-film thicknesses as determined in accordance with SSPC PA-2.

F. Apply primer immediately after blast cleaning and before any surface rusting occurs, or any dust, dirt, or any foreign matter has accumulated. Before applying coating, re-clean surfaces that have surface colored or become moist by blast cleaning.

G. Apply a brush coat of primer on welds, sharp edges, nuts, bolts, and irregular surfaces before applying the primer and finish coat. Apply the brush coat before and in conjunction with the spray coat application. Apply the spray coat over the brush coat.

H. Before applying subsequent coats, allow the primer and intermediate coats to dry for the minimum curing time recommended by the manufacturer. In no case shall the time between coats exceed the manufacturer's recommendation.

I. Each coat shall cover the surface of the preceding coat completely and there shall be a visually perceptible difference in applied shade or tint of colors.

J. Applied coating systems shall be cured at 75°F or higher for 48 hours. If temperature is lower than 75°F, curing time shall be in accordance with printed recommendations of the manufacturer, unless otherwise allowed by the Owner's Representative.

K. Assembled parts shall be disassembled sufficiently before painting or coating to ensure complete coverage by the required coating.

3.09 SURFACES NOT TO BE COATED

A. Do not paint the surfaces listed below unless otherwise noted in the drawings or in other Specification sections. Protect the following surfaces during the painting of adjacent areas:

1. Concrete walkways.

2. Stainless steel.
3. Metal letters.
4. Glass.
5. Fencing.
6. Electrical fixtures except for factory coatings.
7. Nameplates.
8. Grease fittings.
9. Buried pipe, unless specifically required in the piping specifications.

3.10 PROTECTION OF SURFACES NOT TO BE PAINTED

A. Remove, mask, or otherwise protect hardware, lighting fixtures, switch plates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be painted. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process. Mask openings in motors to prevent paint and other materials from entering the motors.

3.11 SURFACES TO BE COATED

A. The exact coating to be applied in any location is not designated by the descriptive phrases in the coating system titles such as “corrosive environment,” “buried metal,” or “submerged metal.” Coat surfaces with the specific coating systems as described below:

1. Coat mechanical equipment, such as pumps as described in the various mechanical equipment specifications. The color of the finish coat shall match the color of the connecting piping.
2. Coat aboveground and exposed piping or piping in vaults and structures as described in the various piping specifications as shown in the Piping Schedule in the drawings. The color of the finish coat shall be as shown in the Piping Schedule in the drawings.
3. Coat valves as described in the various valve specifications. Aboveground valves, or valves in vaults and structures, shall match the color of the connecting piping.
4. Coat concrete surfaces where shown in the drawings.
5. Coat buried flanges, nuts and bolts, valves, flexible pipe couplings, exposed rebar in thrust blocks, and valve boxes as specified in the particular specifications for the above items. Coat buried bolt threads, tie bolt threads, and nuts as specified in System No. 24.

3.12 DRY-FILM THICKNESS TESTING

A. Measure coating thickness specified for carbon steel surfaces with a magnetic-type dry-film thickness gauge in accordance with SSPC PA-2. Provide certification that the gauge has been calibrated by a certified laboratory within the past 6 months. Provide dry-film thickness gauge as manufactured by Mikrotest or Elcometer.

B. Test the finish coat of metal surfaces (except zinc primer and galvanizing) for holidays and discontinuities with an electrical holiday detector, low-voltage, wet-sponge type. Provide measuring equipment. Provide certification that the gauge has been calibrated by a certified laboratory within the past 6 months. Provide detector as manufactured by Tinker and Rasor or K-D Bird Dog.

C. Check each coat for the correct dry-film thickness. Do not measure within 8 hours after application of the coating.

D. For metal surfaces, make five separate spot measurements (average of three readings) spaced evenly over each 100 square feet of area (or fraction thereof) to be measured. Make three readings for each spot measurement of either the substrate or the paint. Move the probe or detector a distance of 1 to 3 inches for each new gauge reading. Discard any unusually high or low reading that cannot be repeated consistently. Take the average (mean) of the three readings as the spot measurement. The average of five spot measurements for each such 100 square-foot area shall not be less than the specified thickness. No single spot measurement in any 100-square-foot area shall be less than 80% nor more than 120% of the specified thickness. One of three readings which are averaged to produce each spot measurement may underrun by a greater amount as defined by SSPC PA-2.

E. For concrete surfaces, make five separate spot measurements spaced evenly over each 100 square feet of area (or fraction thereof) to be measured. The average of five spot measurements for each such 100-square-foot area shall not be less than the specified thickness. No single spot measurement in any 100-square-foot area shall be less than 80% nor more than 120% of the specified thickness.

F. Perform tests in the presence of the Owner’s Representative.

3.13 REPAIR OF IMPROPERLY COATED SURFACES

A. If the item has an improper finish color or insufficient film thickness, clean and topcoat the surface with the specified paint material to obtain the specified color and coverage. Sandblast or power-sand visible areas of chipped, peeled, or abraded paint, feathering the edges. Then prime and finish the coat in accordance

with the Specifications. The work shall be free of runs, bridges, shiners, laps, or other imperfections.

3.14 CLEANING

A. During the work, remove discarded materials, rubbish, cans, and rags at the end of each day's work.

B. Thoroughly clean brushes and other application equipment at the end of each period of use and when changing to another paint or color.

C. Upon completion of painting work, remove masking tape, tarps, and other protective materials, using care not to damage finished surfaces.

END OF SECTION

DIVISION 15

MECHANICAL

SECTION 15055
PIPING SYSTEMS—GENERAL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Specification describes responsibilities and requirements for piping systems including the following:

1. Labor, materials, tools, equipment, and services to be furnished in accordance with the provisions of the Contract Documents. The materials to be used for the piping systems shown in the Drawings are listed by service in the Piping Schedule, included in the Contract Drawings.
2. Coordination of work with other trades.
3. Furnishing and installing all supplementary or miscellaneous items, appurtenances, and devices incidental to or necessary for a sound, secure, and complete installation, although such work is not specifically indicated.
4. Furnishing Record Drawings and documents for piping systems.

1.02 SUBMITTALS

The Contractor shall submit the following in accordance with Section 01330, Submittals and Acceptance:

A. If the Contractor deviates from the piping layout as shown on the Contract Drawings, the Contractor shall submit scaled piping drawings showing locations and dimensions to and from fittings, valves, tanks, equipment, structures, and related appurtenances. Provide scaled drawings to a minimum scale of 1 inch equals 10 feet. Provide details to minimum scale of 1/8 inch equals 1 foot. Elevations shall correspond to reference vertical elevation datum shown or provided for this project.

B. Copies of any manufacturer's written directions regarding material handling, delivery, storage, and installation.

C. Record piping drawings shall meet the requirements of Section 01785, Record Documents. During the work, the Contractor shall maintain accurate, up-to-date Record Drawings of piping systems installed in the project, including pre-existing piping discovered, relocated, or at locations other than as originally shown on the Drawings. When the work is completed and accepted by the Owner and the Engineer, the Contractor shall submit Record Drawings in accordance with Section 01785, Record Documents. The Contractor shall identify complete

location, elevations, and description of piping systems. Piping systems and fittings are to be identified from three points on structures and/or stationary appurtenances.

D. Submit copies of forms documenting required field pressure testing work and results.

E. Submit welding certificate copies.

F. Submit certified copies of mill test reports for bolts and nuts, including coatings if specified. Provide recertification by an independent domestic testing laboratory for materials originating outside of the United States.

G. Submit manufacturer's data sheet for gaskets supplied showing dimensions and bolting recommendations.

H. Support Systems

1. Drawings of each piping system locating each support, guide, and anchor.
2. Identify support, guide, and anchor type by catalog number and shop/ contract drawing detail number.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society of Mechanical Engineers (ASME)

1. ASME B1.1—Unified Inch Screw Threads (UN and UNR Thread Form).
2. ASME B1.20.1—Pipe Threads, General Purpose (Inch).
3. ASME B16.21—Nonmetallic Flat Gaskets for Pipe Flanges.
4. ASME B18.2.1—Square, Hex, Heavy Hex, and Askew Head Bolts, and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series).
5. ASME B18.2.2—Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series).
6. ASME B31.1—Power Piping.
7. ASME B31.3—Process Piping.
8. ASME BPVC—Boiler and Pressure Vessel Code.

B. American Society for Testing and Materials (ASTM)

1. ASTM A183—Specification for Carbon Steel Track Bolts and Nuts.
2. ASTM A193/A193MM—Standard Specification for Alloy-Steel; and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
3. ASTM A194/A194M—Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both.
4. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
5. ASTM D1330—Standard Specification for Rubber Sheet Gaskets.
6. ASTM F467—Standard Specification for Nonferrous Nuts for General Use.

C. American Water Works Association (AWWA)

1. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
2. AWWA C207—Steel Pipe Flanges for Waterworks Service, Sizes 4-Inch through 144-Inch (100 mm through 3,600 mm).

D. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS)

1. MSS SP-58—Pipe Hangars and Supports – Material, Design, and Manufacture, Selection, Application, and Installation.

E. NSF International (NSF)

1. NSF 61/600—Drinking Water System Components – Health Effects.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. The Contractor shall protect the pipe from kinks, cuts, end damage, and other defects when transporting all piping. Binding and tie-down methods shall not

damage or deflect the pipes in any way. Pipe damaged during shipment shall be rejected.

C. Pipe shall be stored on level ground, preferably turf or sand, free of sharp objects that could damage the pipe. Stacking of any pipe shall be limited to a height that will not cause excessive deformation of the lower layers of pipe under anticipated temperature conditions. When necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such widths to not allow deformation of the pipe at the point of contact with the sleeper or between supports. Pipe shall not be removed from storage until bedding or sub-grade work is complete and ready to receive the pipe.

D. The joined pipe shall be handled in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. Ropes, fabric, or rubber-protected slings and straps shall be used when handling pipe. Chains, cables, or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe. Pipe or fittings shall not be dropped. Slings for handling joined pipe shall not be positioned at socket-welded joints. Sections of the pipes with cuts and gouges shall be removed and the ends of the pipe rejoined. In accordance with the pipe manufacturer's written instructions, the Contractor shall repair all pipe with damaged linings and pipe exterior coatings that have been damaged before the pipe is installed.

E. The Contractor shall cover all pipe stored on the site with canvas or other opaque material to protect it from sunlight. Provide air circulation under the covering.

F. The Contractor shall inspect all pipe, fittings, and other accessories upon delivery and during the work. Any defective or damaged materials found during field inspection or during tests shall be removed from the site and replaced by, and at the expense of, the Contractor.

G. The interior of all pipe, fittings, and other accessories shall be kept free from dirt and foreign matter at all times. Fittings shall be drained and stored in a manner that will protect them from damage by freezing.

H. Gaskets shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-delivered-to-site and first-to-be-installed rotation basis. Mechanical-joint glands, bolts, and washers shall be handled and stored in a manner that will ensure proper use with respect to types and sizes.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

1.07 DEFINITIONS OF BURIED, EXPOSED, AND SUBMERGED PIPING

A. Buried piping is piping buried in soil, beneath a structure and/or encased in concrete. Where an exterior pipe coating is specified to be factory- or field-applied, the Contractor shall provide the coating up to the penetration of a structure. Piping encased in concrete does not require an exterior coating other than what is factory furnished.

B. Exposed piping is piping in any of the following conditions or locations:

1. Above ground.
2. Inside buildings, vaults, or other structures.
3. In underground concrete trenches or galleries.

C. Submerged piping is considered to be all piping within a liquid holding tank.

1.08 SYSTEM DESIGN REQUIREMENTS

A. General

1. The Specifications and Drawings are not all inclusive of explicit piping details; provide piping for intended use in compliance with laws and regulations, including ASME B31.1 Code (Power Piping).
2. Pressure ratings and materials specified represent minimum acceptable standards for piping systems.
3. Piping Systems: Suitable for the services specified and intended.
4. Piping shall be color coded in accordance with the Department of Environmental Protection requirements.

B. Support Systems

1. The absence of pipe supports and details on the Drawings shall not relieve the Contractor of responsibility for sizing and providing supports for this project.

2. Select and design within the specified spans and component requirements.

3. Comply with requirements of MSS SP-58.

4. Criteria for structural design and selection of pipe support system components:

    a. Dead loads imposed by the weight of the pipes filled with water, within specified spans and component requirements, plus any insulation.
    b. Safety factor: Minimum of 5.

5. Design, size, and space support anchoring devices, including anchor bolts, inserts, and other devices used to anchor the support, to withstand the shear and pullout loads imposed by loading and spacing on each particular support.

    a. Piping smaller than 30 inches: Supports are shown only where specific types and locations are required; additional pipe supports may be required and are to be provided and installed by the Contractor at no additional cost to the Owner.

C. Adapters

1. No attempt has been made to show all adapters, spool pieces, reducers, bushings, or other fittings required to accommodate the connection of pipes, fittings, and valves of various joint design and sizes throughout the project. The Contractor is completely responsible for providing, at his expense, all adapters, reducers, sleeves, spool pieces, and other fittings and appurtenances necessary for connection of pipe (for the same pipe material of or a transition of pipe materials), valves, fittings, and appurtenances throughout the project, which shall be constructed of appropriate materials, coated and lined to match the materials, coatings, and linings specified for the connected components. All adapters, reducers, sleeves, spool pieces, and other fittings shall be coated and lined in accordance with the specifications for each individual pipe system.

D. Unions

1. No attempt has been made to show all unions required for the project. The Contractor shall provide unions at all connections of threaded pipe to installed equipment unless deleted by the Engineer, in writing, at certain locations. The unions shall meet or exceed the quality of materials, pressure rating, service, and painting requirements of connected piping.

PART 2 PRODUCTS

2.01 PIPING SYSTEM GENERAL REQUIREMENTS SCHEDULE

A. Unless noted otherwise in the Drawings, piping system materials, fittings, and appurtenances are subject to requirements of the individual Specifications for the piping systems.

2.02 PIPING SCHEDULE

A. A piping schedule (flow stream identification) listing the piping identification abbreviations, piping materials, operating pressures, field test pressures, lining systems, and color coding associated with the flow streams is provided on the Contract Drawings. In project locations where the piping system material referenced on the piping schedule is not appropriate, the required piping material is indicated on the Contract Drawings. Materials called out in the Contract Drawings shall govern over materials stated in the piping schedule.

2.03 THREAD FORMING FOR STAINLESS STEEL BOLTS

A. Form threads for stainless steel bolts by rolling, not by cutting or grinding.

2.04 BOLTS AND NUTS FOR FLANGES FOR DUCTILE IRON PIPE FLANGES

A. Bolts, washers, and nuts for pipe installed indoors, outdoors above and below ground, and in vaults and structures shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.

B. Bolts, washers, and nuts for submerged Class 150 flanges shall be Type 304 stainless steel conforming to ASTM A193/A193M (Grade B8) for bolts and ASTM A194/A194M (Grade 8) for nuts. Fit shall be Class 2A conforming to ASME B1.1 when connecting to cast-iron valves having body bolt holes.

2.05 BOLTS AND NUTS FOR TYPE 304 STAINLESS STEEL PIPE FLANGES

A. Bolts, washers, and nuts for flanges shall be Type 304 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

2.06 BOLTS AND NUTS FOR TYPE 316 STAINLESS STEEL PIPE FLANGES

A. Bolts, washers, and nuts for flanges shall be Type 316 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

2.07 BOLTS AND NUTS FOR PVC, CPVC, AND PVDF PIPE FLANGES

A. Bolts for piping in sodium hypochlorite service shall be made of titanium, in accordance with ASTM F467, Grade Ti1, Ti2, or Ti7. Nuts and washers shall conform to ASTM F467 and shall be made of titanium.

B. Bolts, washers, and nuts in chemical service other than sodium hypochlorite shall be Type 304 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

C. Bolts, washers, and nuts for buried and submerged flanges and flanges located outdoors above ground or in vaults and structures shall be Type 304 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

D. The Contractor shall provide a washer under each nut and under each bolthead. Washers shall be of the same material as the nuts.

2.08 BOLTS AND NUTS FOR STEEL PIPE FLANGES

A. Bolts, washers, and nuts for Class 150 flanges (including AWWA C207, Class D) located indoors, outdoors above ground, in vaults, and in structures shall be carbon steel, ASTM A307, Grade B. Bolts, washers, and nuts for buried service shall also be hot-dipped galvanized.

B. Bolts, washers, and nuts for submerged Class 150 flanges shall be Type 304 stainless steel conforming to ASTM A193/A193M (Grade B8) for bolts and ASTM A194/A194M (Grade 8) for nuts. Fit shall be Class 2A in accordance with ASME B1.1 when connecting to cast-iron valves having body bolt holes.

2.09 LUBRICANT FOR STAINLESS STEEL BOLTS AND NUTS

A. Anti-seize thread lubricant shall be applied to the thread portion of all (above grade and below grade) stainless steel bolts (stainless steel tie rods, etc.) during assembly. Anti-seize lubricant shall be chloride free and shall be nongalling NSF approved. Anti-seize thread lubricant shall be Jet-Lube “Nikal,” John Crane “Thred Gard Nickel,” Never-Seez “Pure Nickel Special,” or Permatex “Nickel Anti-Seize.”

2.10 FLANGE GASKETS FOR STEEL, DUCTILE IRON, AND STAINLESS STEEL PIPE

A. Flange gaskets shall be in accordance with AWWA C207, except as modified in this Section. Gaskets shall be ring type. All gasket material shall be suitable for

the fluid being conveyed and shall be resistant to free chlorine concentrations up to 10 mg/L. All gasket material shall be rated to the surge pressures listed in the pipe schedule. Gaskets shall be EPDM, Viton, or an approved equal.

2.11 FLANGE GASKETS FOR DUCTILE-IRON PIPE AND FITTINGS IN RAW SEWAGE

A. Gaskets shall be full face, 1/8 inch thick, Buna-N having a Brinell Hardness of 55 to 65 durometer. Gaskets shall be suitable for a water pressure of 200 psi at a temperature of 250°F. Gaskets shall have "nominal" pipe size inside diameters, not the inside diameters indicated in ASME B16.21. Provide Garlock Style 9122 or equal. The Contractor shall verify that the gaskets are compatible with all chemicals being used.

2.12 FLANGE GASKETS FOR PVC AND CPVC PIPE

A. Gaskets for flanged joints shall be full faced, 1/8 inch thick, having a Brinell Hardness of 50 to 70 durometer A. Gasket material shall be EPR unless noted or specified otherwise. Gasket material for sodium hypochlorite service shall be Viton ETP unless noted or specified otherwise. Gaskets shall be compatible with the fluids conveyed.

2.13 FLANGE GASKETS FOR PVDF PIPE

A. Gaskets for flanged joints shall be full faced, 5/64 inch thick (minimum), made of Teflon-bonded EPDM or PVDF-bonded EPDM. The EPDM shall have a Brinell Hardness of 65 to 70 Durometer “A.” Gaskets shall be suitable for a fluid temperature range of -40˚F to +210˚F and compatible with the fluids conveyed.

2.14 FLANGE GASKETS FOR STAINLESS STEEL PIPE IN CHEMICAL SERVICE

A. Gaskets shall be suitable for a maximum pressure of 300 psi and a maximum temperature of 500°F. The Contractor shall verify that the gaskets are compatible with the fluids conveyed. Gaskets for chemical service shall be one of the following materials:

1. Teflon-envelope type, full face, 1/8 inch thick, with compressed nonasbestos filler. Provide free-flow design in which the Teflon is machined or milled between leaves to provide a space for the filler.
2. Teflon (PTFE) with inert filler, 1/8 inch thick. Product: Garlock "Gylon 3510" shall be used for potassium hydroxide, sodium hypochlorite, and ammonium hydroxide. Garlock “Gylon 3545” shall be used for sulfuric acid, corrosion inhibitor, and hydrofluosilicic acid.

2.15 POTABLE WATER PIPING SYSTEMS

A. All potable water piping systems including pipe, valves, fittings, weld-solvents, linings, gaskets, lubricants, grout disinfection agents, and surfaces in contact with potable water shall meet all local and State of Florida regulations and requirements including NSF 61/600. The Contractor shall coordinate the color of the potable water system piping color with the Owner's color standard and shall provide color as approved by the Owner.

2.16 LOCATOR WIRE (OR DETECTABLE PIPELINE MARKING TAPE)

A. All 2-inch and larger buried piping shall be laid with two insulated, 12-gauge minimum AWG, THWN strand copper wires taped with adhesive-backed tape or tied to the nonmetallic pipe at 5 feet on center for location purposes.

PART 3 EXECUTION

3.01 PREPARATION

A. Field Alignment

1. The piping shown on the Contract Drawings is generally indicative of the work, with symbols and notations provided for clarity. However, the Contract Drawings are not an exact representation of all conditions involved; therefore, install piping to suit actual field conditions and measurements as approved by the Engineer. No extra compensation will be made for work due to differences between indicated and actual dimensions.
2. The Contractor shall install all adapters, fittings, flanged connections, closures, restrained joints, etc. not specified but necessary for a complete installation acceptable to the Engineer.
3. The Contract Drawings do not indicate all adapters, fittings, spool pieces, bushings, unions, supports, hangers, and other items required to accommodate the installing and connecting of pipe, fittings, valves, and equipment of various joint designs and sizes. Provide such required items of appropriate designs, materials, coatings, and linings.
4. An extensive network of underground piping, duct, conduit, direct-buried conductors, and related structures of various sizes, materials, alignments, age, and function exist within the project site. Conclusive information concerning these facilities is not available. Consequently, the design of new piping indicated on the Contract Drawings is approximate. Adjust alignment, fitting, valve, and joint locations as required and as approved by the Engineer to accommodate and protect existing facilities and provide the intended functionality of new piping.

3.02 FIELD LAYOUT AND MODIFICATIONS

A. Unless directed otherwise, the Contractor shall be responsible for setting construction layout stakes and/or offsets required to complete the designated work. The Contractor shall ensure that those stakes and/or offsets are protected and any re-staking required for any reason including work stoppage shall be included in the bid price and no additional compensation to the Contractor will be made.

B. The Engineer has the right to make any modifications the Engineer deems necessary due to field conditions, conflicts with other utilities, or to protect other properties.

3.03 PIPE PRODUCTS INSPECTION

A. The Contractor shall obtain from the pipe manufacturer a certificate of inspection to the effect that the pipe, fittings, gaskets, glands, bolts, and nuts supplied for this Contract have been inspected at the plant and that they meet the requirements of these Specifications. The Contractor shall submit these certificates to the Engineer before installing the pipe materials. The Contractor shall visually inspect all pipe and fittings at delivery and before they are lowered into the trench to be installed. Pipe or fittings that do not conform to these Specifications or have been damaged in any manner will be rejected and the Contractor must remove them immediately. The entire product of any plant may be rejected when, in the opinion of the Engineer, the methods or quality assurance and uniformity of manufacturer fail to secure acceptable and uniform pipe products or where the materials used produce inferior pipe products.

3.04 REMOVAL OF EXISTING PIPE AND FITTINGS

A. Pipe specifically identified on the Drawings to be removed or replaced from service shall be physically taken out of the ground. The limits of pipe to be removed shall be specifically called for in the plans or shall be approved in writing by the Engineer. Any other removal not specifically called for shall be approved in writing and shall be considered incidental to construction of other items in the contract and the Contractor will not receive compensation for such work.

B. When removing pipe the Contractor shall excavate a trench wide enough to dislodge the pipe from the surrounding soil and long enough to be able to handle the pipe without causing any damage to nearby utilities, structures, or adjacent property.

C. The removed pipe, fitting, and appurtenances will become the Contractor's property and the Contractor shall be responsible for proper disposal and any required permits for disposal.

D. Regarding pipe remaining in the ground subsequent to removal of connected pipe or pipe fittings, the remaining buried pipes, openings, and fittings shall be plugged or capped as approved by the Engineer.

E. Pipe that will be abandoned in place shall be plugged or capped as approved by the Engineer.

3.05 BURIED PIPING AND PIPE FITTINGS

A. Trenching and backfilling for all pipe and fittings shall also be in accordance with Section 02305, Earthwork for Utilities.

B. Installation

1. Inspect all piping for defects and remove all lumps or excess coatings before installation. The inside of the mechanical joint and outside of plain-end pipe shall be cleaned before joining pipe. Caution shall be taken to prevent damage to the pipe during lowering into the trench. Remove all foreign matter that has entered the pipe during storage and installation. The Contractor shall cover the pipe ends during installation to prevent debris from entering the pipe. No debris, tools, clothing, or other material shall be placed in the pipe.
2. After being placed in the trench, the pipe shall be brought to the proper line and grade by compacting the approved backfill material under it, except at the bell end. Joint deflection shall not exceed 75% of the manufacturer's limit.
3. The Contractor shall install temporary water-tight plugs on the pipe ends during the time that the pipe is in the trench but no work is in progress. If there is water in the trench upon beginning work, this plug shall remain in place until the trench has been pumped dry, unless otherwise approved by the Engineer, the Engineer’s Representative, or the Owner’s Representative.
4. Buried carbon steel bolts and nuts shall be coated in accordance with the manufacturer’s recommendations.
5. Coat threaded portions of stainless steel bolts and nuts with lubricant before assembly.
6. Restrained plugs or caps shall be inserted into all buried dead end pipes, tees, or crosses. Provide blind flanges for all flanged exposed piping. Restrained plugs and caps installed for pressure testing shall be fully secured and blocked to withstand the test pressure.

7. Where plugging is required because of contract division or phasing for later connection, the ends of such lines shall be equipped with a suitable cast-iron or ductile-iron plug/cap or blind flange with or without a blowoff cock, as shown on the Drawings. Installation or removal of such plugging shall be considered incidental to the work and the Contractor shall not be compensated by the Owner for performing this work.

3.06 FLANGED JOINTS FOR EXPOSED PIPE AND FITTINGS

A. When bolting flanged joints, the Contractor shall avoid restraint on the opposite end of the pipe or fitting, which would prevent uniform gasket compression or which would cause unnecessary stress in the flanges. One flange shall be free to move in any direction while the flange bolts are being tightened. Bolts shall be tightened gradually and at a uniform rate to ensure uniform compression of the gasket, in accordance with pipe and fitting manufacturer's recommendations.

B. Coat threaded portions of stainless steel bolts and nuts with lubricant before assembly.

3.07 PIPING CONNECTIONS TO PUMPS AND OTHER EQUIPMENT

A. When connecting to pumps and equipment, the Contractor shall ensure that piping stresses are not transmitted to the pump and equipment. All connecting pipe shall be permanently supported and aligned so that accurate matching of bolt holes and uniform contact over the entire surface of pump flanges are obtained before any bolts are installed in the flanges or pipe is threaded into pump and equipment. In addition, pump connection piping shall be free to move parallel to its longitudinal center line while the bolts are being tightened.

1. Pumps and equipment shall be leveled, aligned, and wedged into a position that will fit the connecting pipe, but shall not be grouted until the initial fitting and alignment of the pump and equipment may be shifted on its foundation if necessary to properly install the connecting pipe. Each pump and piece of equipment shall, however, be grouted before final bolting of the connecting piping.
2. After final alignment and bolting, the pump and equipment connections shall be tested for applied piping stresses by loosening the flange bolts which, if the piping is properly installed, should result in no movement of the piping relative to the pump or opening of the pump connection joints. If any movement is observed, the piping shall be loosened and re-aligned as required and then the flanges bolted back together. The flange bolts then shall be loosened and the process repeated until no movement is observed.

3. All carbon steel bolts and nuts shall be coated with the same exterior coating applied to the piping system.

3.08 ANCHORING AND RESTRAINING

A. Thrust blocks shall be used in new lines and shall be limited to areas in which a new fitting has been installed in an existing line and field restraining joints are not feasible or when directed by the Engineer.

3.09 FLUSHING, CLEANING, TESTING, AND INSPECTION OF PIPING

A. See Section 15144, Pressure Testing of Piping, for the requirements of pipe flushing, cleaning, pressure testing, and inspection requirements.

3.10 DISINFECTION

A. See Section 15141, Disinfection of Piping and Water Storage Facilities, for the disinfection requirements.

3.11 SPECIAL REQUIREMENTS AND PIPING SPECIALTIES

A. Welding

1. Use only certified welders meeting procedures and performance outlined in Section IX of the ASME BPVC and other codes and requirements in accordance with local building and utility requirements. Submit Welder's certificates to the Engineer for the project record before beginning any welding on the project. The Welder must be certified for all positions (flat, vertical, and overhead).
2. Have all welds conform to highest industrial practice in accordance with ASME B31.1 and ASME B31.3 or other codes and requirements in accordance with local building and utility requirements.

3.12 PIPE COLOR CODING

A. The pipe color shall be as identified on the Drawings. The Contractor shall coordinate with the Engineer and the Owner to generate a list of acceptable pipe colors for exposed piping systems. On applicable pipes, the color shall be in accordance with FDEP color-coding requirements.

END OF SECTION

SECTION 15075
PROCESS EQUIPMENT, PIPING, AND VALVE IDENTIFICATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes requirements for materials and installation of markers, labels, and signs for pipes, and valves; for mechanical equipment; for hazardous materials warnings.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. The Contractor shall submit manufacturer's catalog data and descriptive literature describing materials, colors, letter size, and size of labels.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in the Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American National Standards Institute (ANSI)

1. ANSI Z535.1—Safety Colors.

B. American Society of Mechanical Engineers (ASME)

1. ASME A31.1—Scheme for Identification of Piping Systems.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 LABELS FOR PIPING

A. Labels for piping shall bear the full piping system name as shown in the Piping Schedule on the Drawings. The Contractor shall provide separate flow directional arrows next to each label. Color, size, and labeling shall conform to ASME A13.1 and ANSI Z535.1. Labels for piping inside buildings shall be vinyl cloth: W.H. Brady Co. B-500 vinyl cloth, Seton Name Plate Corporation Pipe Markers, or equal. Labels for piping located outdoors shall be weather- and UV-resistant acrylic plastic and shall be W. H. Brady Co. B-946, Seton Name Plate Corporation Pipe Markers, or equal.

B. Alternatively, the Contractor shall provide preprinted, semirigid, snap-on, color-coded pipe markers. Color, size, and labeling shall conform to ASME A13.1 and ANSI Z535.1. Label shall cover 360º (minimum). Labels shall be fabricated of weather- and UV-resistant acrylic plastic. Labels shall be Seton Nameplate Corporation SetMark pipe marks or equal.

2.02 LABELS FOR VALVES

A. The Contractor shall provide each valve listed on the Tag Number list with an identification tag. The tag shall be 2-inch-square or circular aluminum or 1/16-inch-thick fiberglass: W. H. Brady B-60, Seton Name Plate Corp. Series SVT, or equal. Aluminum tags shall have black-filled letters. The tag shall show the valve name.

2.03 HOSE BIBB SIGNS—UNSAFE WATER

A. The Contractor shall provide a rigid sign labeled "DANGER--UNSAFE WATER" for each hose bibb. Size and lettering shall conform to OSHA requirements. Signs shall be Seton Nameplate Company 20-gauge baked enamel, minimum size 7 inches by 3 inches; Brady B-120 Fiber-Shield fiberglass, minimum size 7 inches by 3 inches, 1/8 inch thick; or equal.

2.04 LABELS FOR MECHANICAL EQUIPMENT

A. The Contractor shall provide a label for each pump or other piece of mechanical equipment. The label shall show the equipment name and tag number as shown on

the Tag Number list or on the Drawings. Labels shall be 1-1/2 inches (minimum) by 4 inches (minimum) brass, aluminum, or 1/8-inch-thick fiberglass tags.

2.05 UNDERGROUND PLASTIC WARNING TAPE FOR PIPE

A. The Contractor shall provide permanent, bright-colored, continuous-printed plastic tape intended for direct burial service, not less than 6 inches wide by 3.5 mils thick. Provide tape with printing that most accurately indicates the type of service of buried pipe. Provide the following colored tape for the various piping services:

Service	Color
Cable TV	Orange
Gas	Yellow
Electric	Red
Telephone	Orange
Water	Blue
Sewer	Green
Chemical	Yellow
Reclaimed Water	Violet

2.06 UNDERGROUND DETECTABLE METALLIC PIPE WARNING TAPE

A. The Contractor shall provide permanent, bright-colored, continuous-printed tape consisting of an aluminum or steel foil sheathed in a plastic laminate, not less than 3 inches wide by 5 mils thick. Provide tape with printing that most accurately indicates the type of buried service. Provide the following colored tape for the various piping services:

Service	Color
Cable TV	Orange
Gas	Yellow
Electric	Red
Telephone	Orange
Water	Blue
Sewer	Green
Chemical	Yellow
Reclaimed Water	Violet

PART 3 EXECUTION

3.01 INSTALLING PIPE LABELS

A. The Contractor shall provide a label and flow arrow at each connection to pumps or other mechanical equipment, at wall boundaries, at tees and crosses, and at 20-foot centers on straight runs of piping.

B. On piping having external diameters less than 6 inches (including insulation, if any), the Contractor shall provide full-band pipe markers, extending 360º around pipe at each location.

C. On piping having external diameters of 6 inches and larger (including insulation, if any), provide either full-band or strip-type pipe markers but not narrower than three times letter height (and of required length), fastened by one of the following methods:

1. Laminated or bonded application of pipe marker to pipe or insulation.
2. Strapped-to-pipe or insulation application of semirigid type with Type 304 or 305 stainless steel bands.

3.02 INSTALLING VALVE AND EQUIPMENT LABELS

A. The Contractor shall attach labels to the valve or piece of equipment with Type 304 or 316 stainless steel chains unless otherwise noted.

B. The Contractor shall attach valve labels to the valve handwheels. If the valve has no handwheel, attach the label to the valve by tying the tag wire or chain around the operating shaft or nut.

3.03 INSTALLING MISCELLANEOUS SIGNS

A. The Contractor shall attach miscellaneous signs according to the sign manufacturer's recommendations and in accordance with OSHA requirements.

3.04 INSTALLING UNDERGROUND PLASTIC WARNING TAPE FOR PIPE

A. During backfilling of each exterior underground piping system, the Contractor shall install continuous underground-type plastic line marker directly over buried line at 6 to 8 inches above the top of the pipe. Where multiple small lines are buried in a common trench and do not exceed an overall width of 16 inches, install a single line marker.

3.05 INSTALLING UNDERGROUND DETECTABLE METALLIC PIPE WARNING TAPE

A. The Contractor shall install tape 4 to 6 inches below finished ground surface directly over buried pipelines. Where multiple small pipelines are buried in a common trench and do not exceed an overall width of 16 inches, install a single marker tape.

END OF SECTION

SECTION 15110
MANUAL, CHECK, AND PROCESS VALVES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all valves as shown in the Drawings and as specified in this Section. All valves shall be complete with all necessary manual actuators, valve boxes, extension stems, and floor stands, which are required for proper valve operation and completion of the work.

1. All valves shall be of the sizes shown in the Drawings. All equipment of the same type shall be from one manufacturer, unless authorized in writing by the Engineer.

2. The valves shall include but not be limited to the following:

a. Air valves.
b. Ball valves.
c. Gate valves.
d. Plug valves.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product technical submittal data shall contain the following information and data:

1. Acknowledgment that products submitted meet requirements of standards referenced.

2. Manufacturer’s installation instructions.

3. Manufacturer’s operation and maintenance manuals.

4. Data of valves, actuators, and accessories:

a. Pressure and temperature rating.
b. Materials of construction, with ASTM reference and grade.
c. Linings and coatings.

d. Dimensions and weight.
e. Flow coefficient.
f. Actuators and accessories details.
g. Manufacturer's product brochure, cut-sheets, and parts diagrams.

B. Dimensions and orientation of valve actuators as installed on the valves. Show location of internal stops for gear actuators. State differential pressure and fluid velocity used to size actuators. For worm-gear actuators, state the radius of the gear sector in contact with the worm and state the handwheel diameter.

C. The following test reports: Performance Tests; Leakage Tests; Hydrostatic Tests; and Proof-of-Design Tests as applicable or required.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Petroleum Institute (API)

1. API SPEC 6D—Specification for Valves.
2. API STD 6FA—Standard for Fire Test for Valves.
3. API STD 594—Check Valves: Flanged, Lug, Wafer, and Butt-Welding.
4. API STD 607—Fire Test for Quarter-Turn Valves and Valves Equipped with Nonmetallic Seats.

B. American Society for Testing of Materials (ASTM)

1. ASTM A36/A36M—Standard Specification for Carbon Structural Steel.
2. ASTM A47/A47M—Standard Specification for Ferritic Malleable Iron Castings.
3. ASTM A48/A48M—Standard Specification for Gray Iron Castings.
4. ASTM A105/A105M—Standard Specification for Carbon Steel Forgings for Piping Applications.
5. ASTM A108—Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
6. ASTM A126—Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
7. ASTM A148/A148M—Standard Specification for Steel Castings, High Strength, for Structural Purposes.
8. ASTM A181/A181M—Standard Specification for Carbon Steel Forgings, for General-Purpose Piping.

9. ASTM A182/A182M—Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.
10. ASTM A193/A193M—Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications.
11. ASTM A194/A194M—Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
12. ASTM A216/A216M—Standard Specification for Steel Castings, Carbon, Suitable for Fusion-Welding, for High-Temperature Service.
13. ASTM A240/A240M—Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
14. ASTM A269/A269M—Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
15. ASTM A276/A276M—Standard Specification for Stainless Steel Bars and Shapes.
16. ASTM A313/A313M—Standard Specification for Stainless Steel Spring Wire.
17. ASTM A322—Standard Specification for Steel Bars, Alloy, Standard Grades.
18. ASTM A351/A351M—Standard Specification for Castings, Austenitic, for Pressure-Containing Parts.
19. ASTM A395/A395M—Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures.
20. ASTM A436—Standard Specification for Austenitic Gray Iron Castings.
21. ASTM A439/A439M—Standard Specification for Austenitic Ductile Iron Castings.
22. ASTM A449—Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use.
23. ASTM A479/A479M—Standard Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels.
24. ASTM A494/A494M—Standard Specification for Castings, Nickel and Nickel Alloy.
25. ASTM A516/A516M—Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service.
26. ASTM A536—Standard Specification for Ductile Iron Castings.
27. ASTM A564/A564M—Standard Specification for Hot-Rolled and Cold-Finished Age-Hardening Stainless Steel Bars and Shapes.
28. ASTM A582/A582M—Standard Specification for Free-Machining Stainless Steel Bars.

29. ASTM A666—Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
30. ASTM A743/A743M—Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application.
31. ASTM A744/A744M—Standard Specification for Castings, Iron-Chromium-Nickel, Corrosion Resistant, for Severe Service.
32. ASTM A890/A890M—Standard Specification for Castings, Iron-Chromium-Nickel-Molybdenum Corrosion-Resistant, Duplex (Austenitic/Ferritic) for General Application.
33. ASTM B16/B16M—Standard Specification for Free-Cutting Brass Rod, Bar, and Shapes for Use in Screw Machines.
34. ASTM B21/B21M—Standard Specification for Naval Brass Rod, Bar, and Shapes.
35. ASTM B61—Standard Specification for Steam or Valve Bronze Castings.
36. ASTM B62—Standard Specification for Composition Bronze or Ounce Metal Castings.
37. ASTM B98/B98M—Standard Specification for Copper-Silicon Alloy Rod, Bar, and Shapes.
38. ASTM B99/B99M—Standard Specification for Copper-Silicon Alloy Wire for General Applications.
39. ASTM B127—Standard Specification for Nickel-Copper Alloy Plate, Sheet, and Strip.
40. ASTM B148—Standard Specification for Aluminum-Bronze Sand Castings.
41. ASTM B150/B150M—Standard Specification for Aluminum Bronze Rod, Bar, and Shapes.
42. ASTM B164—Standard Specification for Nickel-Copper Alloy Rod, Bar, and Wire.
43. ASTM B169/B169M—Standard Specification for Aluminum Bronze Sheet, Strip, and Rolled Bar.
44. ASTM B193—Standard Test Method for Resistivity of Electrical Conductor Materials.
45. ASTM B371/B371M—Standard Specification for Copper-Zinc-Silicon Alloy Rod.
46. ASTM B427—Standard Specification for Gear Bronze Alloy Castings.
47. ASTM B443—Standard Specification for Nickel-Chromium-Molybdenum-Columbium Alloy and Nickel-Chromium-Molybdenum-Silicon Alloy Plate, Sheet, and Strip.
48. ASTM B446—Standard Specification for Nickel-Chromium-Molybdenum-Columbium Alloy (UNS N06625), Nickel-Chromium-Molybdenum-Silicon Alloy (UNS N06219), and Nickel-Chromium-Molybdenum-Tungsten Alloy (UNS N06650) Rod and Bar.

49. ASTM B462—Standard Specification for Forged or Rolled Nickel Alloy Pipe Flanges, Forged Fittings, and Valves and Parts for Corrosive High-Temperature Service.
50. ASTM B463—Standard Specification for UNS N08020 Alloy Plate, Sheet, and Strip.
51. ASTM B472—Standard Specification for Nickel Alloy Billets and Bars for Reforging.
52. ASTM B584—Standard Specification for Copper Alloy Sand Castings for General Applications.
53. ASTM B763/B763M—Standard Specification for Copper Alloy Sand Castings for Valve Applications.
54. ASTM D1248—Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.
55. ASTM D1784—Standard Classification System and Basis for Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
56. ASTM D1785—Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
57. ASTM D2000—Standard Classification System for Rubber Products in Automotive Applications.
58. ASTM D3222—Standard Specification for Unmodified Poly (Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials.
59. ASTM D4101—Standard Classification System and Basis for Specification for Polypropylene Injection and Extrusion Materials.
60. ASTM F441/F441M—Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.
61. ASTM F467—Standard Specification for Non-ferrous Nuts for General Use.
62. ASTM F468—Standard Specification for Non-ferrous Bolts, Hex Cap Screws, Socket Head Cap Screws, and Studs for General Use.

C. American Society of Mechanical Engineers (ASME)

1. ASME B1.20.1—Pipe Threads, General Purpose (Inch).
2. ASME B1.20.7—Hose Coupling Screw Threads (Inch).
3. ASME B16.1—Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250.
4. ASME B16.5—Pipe Flanges and Flanged Fittings NPS 1/2 through NPS 24 Metric/Inch Standard.
5. ASME B16.10—Face-to-Face and End-to-End Dimensions of Valves.
6. ASME B16.11—Forged Fittings, Socket-Welding and Threaded.
7. ASME B16.18—Cast Copper Alloy Solder Joint Pressure Fittings.
8. ASME B16.24—Cast Copper Alloy Pipe Flanges, Flanged Fittings, and Valve Classes 150, 300, 600, 900, 1500, and 2500.

9. ASME B16.34—Valves – Flanged, Threaded, and Welding End.
10. ASME B16.42—Ductile Iron Pipe Flanges and Flanged Fittings Classes 150 and 300.
11. ASME B16.47—Large Diameter Steel Flanges NPS 26 through NPS 60 Metric/Inch Standard.
12. ASME B36.10M—Welded and Seamless Wrought Steel Pipe.

D. American Society of Safety Engineers (ASSE)

1. ASSE 1011—Performance Requirements for Hose Connection Vacuum Breakers.

E. American Water Works Association (AWWA)

1. AWWA C110/A21.10—Ductile-Iron and Gray-Iron Fittings.
2. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
3. AWWA C115/A21.15—Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
4. AWWA C207—Steel Pipe Flanges for Waterworks Service, Sizes 4-Inch through 144-Inch (100 mm through 3,600 mm).
5. AWWA C500—Metal-Seated Gate Valves for Water Supply Service.
6. AWWA C504—Rubber-Sealed Butterfly Valves.
7. AWWA C507—Ball Valves 6-Inch through 60-Inch (150 mm through 1,500 mm).
8. AWWA C508—Swing-Check Valves for Waterworks Service, 2-Inch through 48-Inch (50 mm through 1,200 mm) NPS.
9. AWWA C509—Resilient-Seated Gate Valves for Water Supply Service.
10. AWWA C512—Air Release, Air/Vacuum, and Combination Air Valves for Water and Wastewater Service.
11. AWWA C515—Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service.
12. AWWA C550—Protective Interior Coatings for Valves and Hydrants.
13. AWWA C606—Grooved and Shouldered Joints.
14. AWWA C800—Underground Service Line Valves and Fittings.

F. Fluid Controls Institute (FCI)

1. ANSI/FCI 70-2—Control Valve Seat Leakage.

G. Manufacturers Standardization Society (MSS)

1. MSS SP-61—Pressure Testing of Valves.
2. MSS SP-67—Butterfly Valves.

3. MSS SP-68—High Pressure Butterfly Valves with Offset Design.
4. MSS SP-81—Stainless-Steel or Stainless-Steel-Lined, Bonnetless, Knife Gate Valves with Flanged Ends.
5. MSS SP-83—Class 3000 Steel Pipe Unions Socket Welding and Threaded (Carbon Steel, Alloy Steel, Stainless Steel, and Nickel Alloy).
6. MSS SP-108—Resilient-Seated Cast Iron Eccentric Plug Valves.

H. National Association of Corrosion Engineers International (NACE)

1. NACE AMPP MR0103—Petroleum, Petrochemical, and Natural Gas Industries – Metallic Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments.
2. NACE AMPP MR0175/ISO15156—Petroleum and Natural Gas Industries – Materials for Use in H2S-Containing Environments in Oil and Gas Production.

I. National Fluid Power Association (NFPA)

1. NFPA T3.6.7—Fluid Power Systems and Products – Square Head Industrial Cylinders – Mounting Dimensions.
2. NFPA T3.6.68—Fluid Power – Square Head Cylinders – Determination of the Static Failure Pressure Rating of Pressure-Containing Components.

J. NSF International (NSF)

1. NSF 61/600—Drinking Water System Components – Health Effects.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. All valves, unless otherwise directed, shall be loaded and unloaded by lifting, and under no circumstances shall valves be dropped, skidded, or rolled. Valves shall not be stacked or placed under pipe, fittings, or other valves in such a manner that damage could result.

C. Slings, hooks, or tongs used for lifting shall be padded in such a manner as to prevent damage to exterior surface or interior linings and valve components. If any part of the coating, lining, or components is damaged, the repairs or replacement shall be made by the Contractor at his expense and in a manner satisfactory to the Engineer before attempting to install such valves.

D. Only new valves will be allowed for installation and shall be stored in a manner to prevent damage and be kept free of dirt, mud, or other debris.

1.06 QUALIFICATIONS

A. All of the valves shall be products of well-established firms which are fully experienced, reputable, have been selling this product for a minimum of 10 years, and are qualified in the manufacture of the particular product furnished. The valves shall be designed, constructed, and installed in accordance with the requirements and procedures of applicable AWWA standards and shall comply with these Specifications as applicable.

1.07 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

1.08 VALVE TYPE CLASSIFICATIONS

A. Air Valves (Type 100 series)

1. Type 125: Combination Air Valves for Water Services, Single Body.
2. Type 140: Air Valves for Sewage Services, Air Release.

B. Ball Valves (Type 200 series)

1. Type 221: Full-Port Threaded Stainless-Steel Ball Valves, 2 Inches and Smaller, for Water Service.
2. Type 231: Full-Port Threaded Carbon-Steel Ball Valves, 2 Inches and Smaller.

C. Gate Valves (Type 600 series)

1. Type 637: Ductile-Iron Resilient Wedge Tapping Gate Valves, 4 Inches through 16 Inches (AWWA C515).
2. Type 682: Cast-Iron Resilient Wedge Gate Valves, 3 Inches through 20 Inches, for Buried Service (AWWA C509).

D. Plug Valves (Type 900 series)

1. Type 920: Cast-Iron Non-Lubricated Eccentric Plug Valves, 4 Inches and Larger.

PART 2 PRODUCTS

2.01 GENERAL

A. Valves are identified in the Drawings by size and type number. For example, a callout of 36V300 refers to a 36-inch-diameter Type 300 valve. A Type 300 valve is a flanged, rubber-seated butterfly valve that is 4 inches through 72 inches for exposed service.

B. All valves shall be complete with all necessary geared actuators, chainwheels and chains, handwheels, levers, valve bonnets, valve boxes, extension stems, operating nuts, and T-handle wrenches, which are required for proper valve operating and completing of the work included under this Section. Renewable parts including discs, packing, and seats shall be of types specified in this Section and acceptable by valve manufacturer for the intended service. All units shall have the name of the manufacturer and the size of the valve cast on the body or bonnet or shown on a permanently attached stainless-steel plate in raised embossed letters. All isolation valves shall be suitable for the intended service with bubble-tight shutoff to flow in either direction.

C. Bronze or brass components in contact with water shall comply with the following requirements:

Constituent	Content
Zinc	7% maximum
Aluminum	2% maximum
Lead	8% maximum
Copper + Nickel + Silicon	83% minimum

D. Valves and valve operators shall be factory prepared and primed and field finish coated in accordance with Section 09900, Painting and Coating.

2.02 VALVE ACTUATORS

A. The valve actuator shall be an integral part of a valve. The valve actuator shall be provided, installed, and adjusted by the valve manufacturer. Actuator mounting arrangements shall facilitate operation and maintenance and shall be determined by the valve manufacturer unless indicated otherwise on the Drawings or directed by the Engineer.

B. All valves shall open counter clockwise as viewed from the top. Unless otherwise required by the Owner, the direction of rotation of the wheel or wrench nut to open each valve shall be to the left (counterclockwise). Each valve body or actuator shall have the word "Open" cast on it and an arrow indicating the direction to open.

C. Actuators shall clearly indicate valve position and an adjustable stop shall be provided to set closing torque. All exposed nuts, bolts, and washers shall be AISI Type 304 stainless steel. Unless noted otherwise, valves shall be equipped with the following manual actuators:

1. Exposed Valves 6 Inches and Smaller: removable lever or handwheel actuators.
2. Exposed Valves 8 Inches and Larger: geared actuators with handwheels.
3. Buried or Submerged Valves 6 Inches and Smaller: 2-inch-square operating nuts (with valve bonnets, valve boxes, and extension stems as required) and T-handle wrench.
4. Buried or Submerged Valves 8 Inches and Larger: Geared actuators with 2-inch-square operating nuts (with valve bonnets, valve boxes, and extension stems as required) and wrench.

D. Levers or handwheels shall be provided to actuate the valves where the valves are within 6 feet and 7 inches from finished grade or the operating floor. Handwheels shall be constructed of ductile-iron. Levers and handwheels shall be coated in accordance with Section 09900, Painting and Coating. Handwheel diameters for traveling nut actuators shall not exceed 8 inches for valves 12 inches and smaller and shall not exceed 12 inches for valves 20 inches and smaller.

E. Chainwheel and guide actuators shall be provided for all exposed valves installed with their centerlines more than 6 feet and 9 inches above finished grade. Chainwheels shall be cast-iron with stainless-steel stem, clip, and pins. The actuating chain shall be AISI Type 304 stainless steel. Stainless-steel chain baskets shall also be provided with these units. Chainwheels shall be coated in accordance with Section 09900, Painting and Coating. Chainwheels and guides shall be Clow Figure F-5680, DeZurik Series W or LWG, Stockham, or equal.

F. Gear actuators for valves 8 inches through 20 inches shall be of the worm-and-gear or of the traveling-nut type. Gear actuators for valves 24 inches and larger shall be of the worm-and-gear type. Gear actuators for motorized valves shall be of the worm-and-gear type, regardless of size.

1. Gear actuators should be designed assuming that the differential pressure across the valves is equal to the test pressure of the connecting piping and

assuming a line fluid temperature range of 33°F to 125°F, unless otherwise required in the detailed valve specifications.

2. Gear actuators shall be enclosed and oil lubricated with seals provided on shafts to prevent entry of dirt and water into the actuator. Gear actuators for valves aboveground or in vaults and structures shall have handwheels. The actuators for valves in exposed service shall contain a dial indicating the position of the valve disc or plug.
3. Traveling nut and worm-and-gear actuators shall be of the totally enclosed design and proportioned to permit operation of the valve under full differential pressure rating of the valve with a maximum pull of 80 pounds on the handwheel or crank. Stop-limiting devices shall be provided in the actuators in the open and closed positions. Actuators shall be of the self-locking type to prevent the disc or plug from creeping. Design actuator components between the input and the stop-limiting devices to withstand without damage a pull of 200 pounds for handwheel or chainwheel actuators and an input torque of 300 foot-pounds for operating nuts when operating against the stops.
4. The self-locking worm gear shall be a one-piece design of gear bronze material (ASTM B427; or ASTM B584, Alloy C86200) that is accurately machine cut. Actuators for eccentric and lubricated plug valves may use ductile-iron gears provided the gearing is totally enclosed with spring-loaded rubber lip seals on the shafts. The worm shall be hardened alloy steel (ASTM A322, Grade G41500 or G41400; or ASTM A148/A148M, Grade 105-85) with thread ground and polished. Support worm-gear shafts at each end by ball or tapered roller bearings. The reduction gearing shall run in a proper lubricant. The handwheel diameter shall be no more than twice the radius of the gear sector in contact with the worm. Worm-gear actuators shall be Limitorque Model HBC, EIM Series W, or equal.

G. For buried or submerged service, provide watertight shaft seals and watertight valve and actuator cover gaskets. Provide totally enclosed actuators designed for buried or submerged service.

H. All buried valves shall have non-rising stems. All buried valves 3 feet below grade or deeper as measured at the valve centerline shall be furnished with an operator stem extension to extend the operating nut within 6 inches from the top of the valve box cover.

2.03 VALVE END CONNECTIONS

A. Provide valve end connections conforming to connected piping and as shown in the Drawings. Generally, all buried valves shall be mechanical joint type end connectors. Exposed valves shall be screwed-end, socket-weld end, or flanged to conform to adjacent exposed connected piping system.

B. Comply with the following standards:

1. Threaded: ASME B1.20.1.
2. Flanged: ASME B16.1 Class 125 unless other noted or AWWA C207.
3. Mechanical (gland) Type: AWWA C111/A21.11.
4. Soldered: ASME B16.18.

C. Nuts, Bolts, and Washers: Wetted or internal to be bronze or stainless-steel. Exposed to be zinc or cadmium-plated.

D. Epoxy Interior Coating: Provide epoxy coating for all interiors of ferrous valve body surfaces in accordance with AWWA C550. Coatings shall be NSF-approved for valves in all potable water piping services. Coatings shall not be required for stainless-steel valve interiors.

2.04 VALVE BOXES

A. All buried valves 2-inch size and larger shall be equipped with a standard cast-iron roadway valve box. Valve boxes shall be of the slip or sliding type with a round lid marked "Water" for potable water valves or “Sewer” for wastewater and a square lid marked “Reclaimed Water” for reclaimed water valves. The box shall be designed to prevent transfer of the surface loads directly to the valve or piping. Valve boxes must have a minimum adjustable range of 12 inches and a minimum inner diameter of 6 inches. All valve boxes and lids shall be produced from grey cast-iron conforming to the latest revision of specification for grey iron castings, ASTM A48/A48M, Class 20A-25A. All castings shall be true and free of holes and shall be cleaned according to good foundry practice, chipped and ground as needed to remove fins and rough places on castings. Valve boxes have to be rated to sustain FDOT H-20 loadings and have a minimum depth of 8 inches. The valve box lid shall fit flush in the top of the box without forcing and shall not rock, tip, or rattle.

B. Provide debris cap as required in the Drawings.

C. Coat buried cast-iron pieces as specified in Section 09900, Painting and Coating, System No. 21 or with fusion-bonded epoxy.

D. Valve boxes shall be as manufactured by Tyler Pipe, Geneco, Star Pipe Products, or equal.

2.05 EXTENSION STEMS

A. Where the depth of the valve is such that its centerline is more than 4 feet below grade, provide operating extension stems to bring the operating nut to a point 6 inches below the surface of the ground and/or box cover. Where the valve is submerged, provide operating extension stems to bring the operating nut to 6 inches above the water surface. Extension stems shall be Type 316 stainless steel, solid core, and shall be complete with 2-inch-square operating nut. The connections of the extension stems to the operating nuts and to the valves shall withstand without damage a pull of 300 foot-pounds.

B. Extension stem diameters shall be as tabulated below:

Valve Size (inches)	Minimum Extension Stem Diameter (inches)
2	3/4
3, 4	7/8
6	1
8	1-1/8
10, 12	1-1/4
14	1-3/8
16, 18	1-1/2
20, 24, 30, 36	1-3/4
42, 48, 54	2

C. Provide buried valves or valves located inside manholes or vaults with valve boxes cast in the manhole or vault roof with a valve position indicator designed to fit standard 5-1/4-inch valve boxes. The indicators shall show valve position and the direction and number of turns required to fully open (or close). All internal gearing shall be sealed. Ship each unit ready for field installation complete with valve box cast-iron adapter, capscrews, guide bushing, position indicator, flexible washer, centering plate, and 2-inch AWWA nut. Valve box and indicator shall be provided by the valve manufacturer. Indicators shall be Westran Position Indicator, Pratt Diviner, or equal.

2.06 FLOOR STANDS

A. When required by the installations, provide floor stands for the operation of valves. Floor stands shall be of the nonrising stem, indicating type, complete with steel extension stems, couplings, handwheels, stem guide brackets, and special yoke attachments as required by the valves and recommended and supplied by the stand manufacturer. Floor stands shall be cast-iron base type: Clow, Figure F-5515; Bingham and Taylor; Stockham; or equal. Handwheels shall turn counterclockwise to open the valves.

B. Provide Type 316 stainless-steel anchor bolts.

C. Provide Type 316 stainless-steel extension stems for valves in exposed service. Provide Type 316 stainless-steel stems for valves in submerged service.

D. Provide adjustable stem guide brackets for extension stems. The bracket shall allow valve stems to be set over a range of 2 to 36 inches from walls. Provide bushings drilled to accept up to 2-inch-diameter stems. Base, arm, and clamp shall be Type 316 stainless-steel. Bushing shall be bronze (ASTM B584, Alloy C86400 or C83600). Bolts, nuts, screws, and washers (including wall anchor bolts) shall be Type 316 stainless steel. Provide slots in the bracket to accept 3/4-inch bolts for mounting the bracket to the wall. Products: Trumbull Industries, Inc., Adjustable Stem Guide or equal.

2.07 BOLTS, NUTS, AND GASKETS FOR FLANGED VALVES

A. Bolts, nuts, and gaskets for flanged valves shall be as described in Section 15055, Piping Systems—General.

2.08 PAINTING AND COATING

A. Coat buried metal valves at the place of manufacture as specified in Section 09900, Painting and Coating, System No. 21.

2.09 AIR VALVES (TYPE 100 SERIES)

A. General Description

1. All valves shall meet or exceed all applicable provisions of the latest revision of AWWA C512. All valves for drinking water services shall comply with NSF 61/600. Design pressure is 150 psig. Valves shall be operable for water temperatures of above freezing to 125°F.
2. All valves shall consist of a float or a float assembly. Valves shall be identified properly in plates attached permanently on the valve body. The body and cover shall be cast-iron ASTM A126, Class B, or ASTM A48/A48M, Class 35. Valves 3 inches and smaller shall have threaded ends. Valves 4 inches and larger shall have flanged ends. Threaded ends shall comply with ASME B1.20.1. Flanges shall comply with ASME B16.1, Class 125. All flanges shall be flat faced.
3. The float shall be Type 304 or 316 Stainless-Steel. For valves with inlet sizes less than 4 inches, the float shall be able to withstand a collapse pressure of 1,000 psig. For inlet sizes 4 inches and larger, the float shall be capable of withstanding collapse pressures of 750 psig. Trim shall be Type 304 or 316 Stainless-Steel. The valve seat shall be of EPDM or other

rubber materials applicable to wastewater and sludge. The valve seat shall be easily removed and replaced in the field.

4. Drain/test ports on all valves with inlet size 1 inch or larger shall have two 1/2-inch NPT minimum plugged ports, one near the bottom of the valve body and the other near the top of the valve. The plug shall be of bronze, ASTM B584, Alloy C83600.

B. Type 125—Combination Air Valves for Water Services, Single Body

1. Type 125 combination air valve for water service shall be 1-inch through 4-inch inlet size. It shall consist of an air and vacuum valve with an air-release valve in a single-body double-orifice arrangement. The valve body and cover shall be constructed of ASTM A126 Class B cast-iron. The body inlet shall be baffled with a Buna-N float cushion. The floats shall be 300 series stainless-steel. The seats shall be Buna-N and provide drop tight shut-off. Valves shall be APCO 140C Series, Val-Matic Model 201C – 204C, or equal.

C. Type 140—Air Valves for Sewage Services, Air Release

1. Type 140 air valves for sewage service shall be A.R.I. Model S-025, or equal.

2.10 BALL VALVES (TYPE 200 SERIES)

A. Type 221—Full-Port Threaded Stainless-Steel Ball Valves, 2 Inches and Smaller, for Water Service

1. Stainless-steel ball valves 2 inches and smaller for water service shall be rated at a minimum pressure of 1,000 psi WOG at a temperature of 100°F. Provide full-port ball and body design. Valve body, ball, and stem shall be Type 316 stainless-steel, ASTM A276/A276M or A351. Seat and seals shall be reinforced PTFE. Valves shall have lever actuators, plastic coated. Valves shall have screwed ends (ASME B1.20.1) and nonblowout stems. Valves shall be Worcester Series 59, Apollo 86A-100 Series, or approved equal.

B. Type 231—Full-Port Threaded Carbon-Steel Ball Valves, 2 Inches and Smaller

1. Carbon-steel ball valves 2 inches and smaller shall be rated at a minimum pressure of 1,000 psi WOG at a temperature of 100°F. Valve body shall be carbon-steel, ASTM A216/A216M, Grade WCB. Ball shall be Type 316 stainless-steel or carbon-steel, chrome, or nickel-plated. Seat and seals shall be reinforced PTFE. Valves shall have lever handle, plastic coated.

Valves shall have screwed ends (ASME B1.20.1) and nonblowout stems. Valves shall be Worcester Series 59, Apollo 83A-140 Series, or approved equal.

2.11 BUTTERFLY VALVES (TYPE 300 SERIES) (NOT USED)

2.12 CHECK VALVES (TYPE 400 SERIES) (NOT USED)

2.13 DIAPHRAGM VALVES (TYPE 500 SERIES) (NOT USED)

2.14 GATE VALVES (TYPE 600 SERIES)

A. Type 637—Ductile-Iron Resilient Wedge Tapping Gate Valves, 4 Inches through 16 Inches (AWWA C515)

1. Valves shall comply with AWWA C515 and the following. Valves shall be of the bolted bonnet type with nonrising stems. Valve stems shall be Type 304 or 316 stainless-steel or cast, forged, or rolled bronze. Stem nuts shall be made of solid bronze. Bronze for internal working parts, including stems, shall not contain more than 2% aluminum nor more than 7% zinc. Bronze shall conform to ASTM B62 or ASTM B584 (Alloy C83600), except that the stem bronze shall have a minimum tensile strength of 60,000 psi, a minimum yield strength of 30,000 psi, and a minimum of 10% elongation in 2 inches (ASTM B584 or B763/B763M, Alloy C87600 or C99500). Body bolts shall be Type 316 stainless-steel. Ends shall be flanged, Class 125, ASME B16.1. One end shall have slotted bolt holes in accordance with AWWA C515, Paragraph 4.4.1.3.4 to fit tapping machines.
2. Provide reduction-thrust bearings above the stem collar. Stuffing boxes shall be O-ring seal type with two rings located in the stem above the thrust collar. Each valve shall have a smooth unobstructed waterway free from any sediment pockets.
3. Valves shall be lined and coated at the place of manufacture with either fusion-bonded epoxy or heat-cured liquid epoxy. Minimum epoxy thickness shall be 8 mil.
4. Manufacturers: Clow, AVK, American Flow Control, Mueller, Waterous, Kennedy, or equal.

B. Type 682—Cast-Iron Resilient Wedge Gate Valves, 3 Inches through 20 Inches, for Buried Service (AWWA C509)

1. Valves 2 inches and larger for buried service operation shall be of cast-iron or ductile-iron body construction and conform to AWWA C509 for resilient seated gate valves. The valve design shall incorporate non-rising

stems and "O" ring stem seals. Valves shall open counterclockwise. Valves shall be designed for bubbletight shutoff to flow in either direction. Before shipment, the valve manufacturer shall test each valve to 200 psi pressure differential in both directions and provide a certificate to the Engineer stating that each valve provided bubbletight shutoff during testing. The valve interior shall be epoxy coated on the entire ferrous surface of the waterway. The valve exterior shall be coated in accordance with Section 09900, Painting and Coating, and encased with polyethylene as specified in this Section for ductile-iron pipe and fittings. Buried valves shall be equipped with standard 2-inch-square operating nuts.

2. Buried valves 2 inches and larger shall have mechanical joint ends, conforming to AWWA C111/A21.11. Valves shall be furnished complete with bolts, nuts, and gaskets.
3. Gate valves shall be manufactured by Mueller, American Flow Control, Kennedy, or approved equal.

2.15 GLOBE AND ANGLE VALVES (TYPE 700 SERIES) (NOT USED)

2.16 PINCH (TYPE 800 SERIES) (NOT USED)

2.17 PLUG (TYPE 900 SERIES)

A. Plug and Seating Design for Eccentric Plug Valves (Type 920): Eccentric plug valves shall comply with MSS SP-108 and the following. Provide a rectangular plug design, with an associated rectangular seat. Provide bidirectional seating design. The valve shall seat with the rated pressure upstream and downstream of the closed plug. Provide geared actuators sized for bidirectional operation.

B. For Type 920 eccentric plug valves, the metallic portion of the plug shall be one-piece design and shall be without external reinforcing ribs which result in a space between the rib and the main body of the plug through which water can pass. Valves shall be repackable without any disassembly of valve or actuator. The valve shall be capable of being repacked while under the design pressure in the open position. Nowhere in the valve or actuators shall the valve shaft be exposed to iron-on-iron contact. Sleeve bearings shall be stainless-steel in valve sizes 20 inches and smaller and bronze or stainless-steel in valve sizes 24 inches and larger. Provide enclosed worm-gear actuators for valves 6 inches and larger.

C. Rubber compounds shall have less than 2% volume increase when tested in accordance with ASTM D471 after being immersed in distilled water at a temperature of 73.4°F ±2°F for 70 hours.

D. Type 920—Cast-Iron Non-Lubricated Eccentric Plug Valves, 4 Inches and Larger

1. Plug valves 4 inches and larger shall be of the non-lubricated eccentric type with resilient faced plugs and shall be furnished with flanges or mechanical-joint end connections to match connecting piping and as shown in the Drawings. Flanged valves shall be 125-pound flanges and faced and drilled to the ASME B16.1, 125-pound standard. Mechanical joint ends shall conform to AWWA C111/A21.11. Valve bodies shall be of ASTM A126 Class B cast-iron. Valves shall be furnished with a welded overlay seat of not less than 90% pure nickel. Seat area shall be raised, with raised surface completely covered with weld to ensure that the plug face contacts only nickel. Screwed-in seats shall not be acceptable. The plug shall have a cylindrical seating surface eccentrically offset from the center of the plug shaft. The interference between the plug face and body seat, with the plug in the closed position, shall be externally adjustable in the field with the valve in the line under pressure. Plugs shall be resilient faced with Hycar (Acrylonitrile-Butadiene) or Buna N, formulated and constructed to be suitable for use with wastewater. Minimum port areas shall be 80% of full pipe flow area. Valves shall have sleeve-type metal bearings and shall be of sintered, oil-impregnated, permanently lubricated Type 316 ASTM. Nonmetallic bearings shall not be acceptable. Valve shaft seals shall be of the multiple V-ring type or U-cup type and shall be externally adjustable and replaceable without removing the bonnet or actuator from the valve under pressure. Valves using O-ring seals or non-adjustable packing shall not be acceptable. All exposed nuts, bolts, springs, washers, and other fasteners shall be 300-series stainless-steel. Valve working pressure ratings shall be a minimum of 150 psi. Each valve shall be given a hydrostatic and seat test with certified copies of proof-of-design test reports as outlined in AWWA C504, Section 5.5. Plug valves shall be DeZurik PEC Series, Henry Pratt Company “Ballcentric” Series, or approved equal.

2.18 SOLENOID VALVES (TYPE 1000 SERIES) (NOT USED)

2.19 OTHER SPECIAL TYPES OF VALVES (TYPE 1100) (NOT USED)

PART 3 EXECUTION

3.01 JOINTS

A. Bolt holes of flanged valves shall straddle the horizontal and vertical centerlines of the pipe run to which the valves are attached. Clean flanges by wire brushing before installing flanged valves. Clean flange bolts and nuts by wire brushing, lubricate threads with oil and graphite, and tighten nuts uniformly and

progressively. If flanges leak under pressure testing, loosen or remove the nuts and bolts, reseat or replace the gasket, reinstall or retighten the bolts and nuts, and retest the joints. Joints shall be watertight.

B. Clean threaded joints by wire brushing or swabbing. Apply Teflon joint compound or Teflon tape to pipe threads before installing threaded valves. Joints shall be watertight.

C. Install lug-type valves with separate hex head machine bolts at each bolt hole and each flange (two bolts per valve bolt hole).

D. Install grooved-end couplings for valves in accordance with Section 15055, Piping Systems—General.

3.02 INSTALLING EXPOSED VALVES

A. Unless otherwise indicated in the Drawings, install valves in horizontal runs of pipe having centerline elevations 4 feet 6 inches or less above the floor with their operating stems vertical. Install valves in horizontal runs of pipe having centerline elevations between 4 feet 6 inches and 6 feet 9 inches above the floor with their operating stems horizontal.

B. Install valves on vertical runs of pipe that are next to walls with their stems horizontal, away from the wall. Valves on vertical runs of pipe that are not located next to walls shall be installed with their stems horizontal, oriented to facilitate valve operation.

3.03 INSTALLING BURIED VALVES

A. Connect the valve, coat the flanges, apply tape wrapping or polyethylene encasement as required on the Drawings, and place and compact the backfill to the height of the valve stem.

B. Place block pads under the extension pipe to maintain the valve box vertical during backfilling and repaving and to prevent the extension pipe from contacting the valve bonnet.

C. Mount the upper slip pipe of the extension in midposition and secure with backfill around the extension pipe. Pour the concrete ring allowing a depression so the valve box cap will be flush with the pavement surface.

D. In streets without concrete curbs and in open areas, install the valve box as for a paved area with concrete curb but include a marker post. Cut the marker post from 4-inch-by-4-inch dense structural grade Douglas fir No. 2 or Southern Pine

No. 2 surfaced on four sides to a length of 5 feet. Chamfer the top. Set the post in concrete, 2 feet into the ground, away from traffic, and to the side of the pipeline. Coat with a seal and finish coat of white alkyd exterior paint. On the side facing the valve, letter in black the word "VALVE" and the distance in feet from the marker post to the valve box cap.

E. Install debris cap as close as possible under the cast-iron cover without interfering with the cover operation. Trim flexible skirt to provide a smooth contact with the interior or the extension pipe.

3.04 INSTALLING EXTENSION STEM GUIDE BRACKETS

A. Install extension stem guide brackets at 6- to 8-foot centers. Provide at least two support brackets for stems longer than 10 feet, with one support near the bottom of the stem and one near the top.

3.05 FIELD COATING BURIED VALVES

A. Coat flanges of buried valves and the flanges of the adjacent piping and the bolts and nuts of flanges and mechanical joints, as specified in Section 09900, Painting and Coating, System No. 24.

B. Wrap buried metal valves 6 inches and larger with polyethylene sheet as specified in Section 15155, Ductile Iron Pipe and Fittings.

3.06 VALVE LEAKAGE AND FIELD TESTING

A. Test valves for leakage at the same time that the connecting pipelines are tested. See Section 15144, Pressure Testing of Piping, for pressure testing requirements. Protect or isolate any parts of valves, actuators, or control and instrumentation systems whose pressure rating is less than the pressure test. Valves shall show zero leakage. Repair or replace any leaking valves and retest.

B. Operate manual valves through three full cycles of opening and closing. Valves shall operate from full open to full close without sticking or binding. Do not backfill buried valves until after verifying that valves operate from full open to full closed. If valves stick or bind or do not operate from full open to full closed, repair or replace the valve and repeat the tests.

C. Test gear actuators through three full cycles from full-open to full-close without binding or sticking. The pull required to operate handwheel- or chainwheel-operated valves shall not exceed 80 pounds. The torque required to operate valves having 2-inch AWWA nuts shall not exceed 150 foot-pounds. If actuators stick or bind or if pulling forces and torques exceed the values stated previously, repair or

replace the actuators and repeat the tests. Operators shall be lubricated in accordance with the manufacturer's recommendations before operating.

WATER SERVICE CARD

Date of Installation _____

Contract Drawing Number_____

Service Line Size (inches) _____
Length of Water Service Line (feet) _____
Meter Size (inches) _____

Name _____
House/Business Address or Location:

_____
_____
_____

Phone # _____

GPS coordinate @ main _____
GPS coordinate @ meter _____
Confirm Photos are attached _____

Installation Foreman _____

Service Layout

Provide a brief sketch of the installed configuration. Indicate lengths, depths of the water service, and show three ties to meter box and to corporation stop:

Depth @ Main (feet) _____
Depth @ stub out (feet) _____

_____ _____
Contractor Signature Resident Observer Signature

(Rev 2 – 15 Oct 2006)

END OF SECTION

SECTION 15121
MISCELLANEOUS PIPE FITTINGS AND ACCESSORIES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section describes requirements for materials and installation of miscellaneous piping specialties, such as quick-connect couplings and flanged coupling adapters.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Submit manufacturer's catalog data and descriptive literature showing dimensions and materials of construction by ASTM reference and grade. Show coatings.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Iron and Steel Institute (AISI)

1. AISI C1012—Specification for Hard-Drawn Low-Carbon Steel.

B. American Society for Testing and Materials (ASTM)

1. ASTM A36/A36M—Standard Specification for Carbon Structural Steel.
2. ASTM A240/A240M—Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
3. ASTM A513/A513M—Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
4. ASTM A536—Standard Specification for Ductile Iron Castings.
5. ASTM A635/A635M—Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Hot-Rolled, Alloy, Carbon, Structural, High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability, General Requirements for.

6. ASTM C219—Standard Terminology Relating to Hydraulic Cement.
7. ASTM D2000—Standard Classification System for Rubber Products in Automotive Applications.

C. American Society of Mechanical Engineers (ASME)

1. ASME B16.1—Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250.
2. ASME SA36—Carbon Steel Shapes, Plates, and Bars of Structural Quality for Use in Riveted, Bolted, or Welded Construction.
3. ASME SA675— Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties (Carbon Steel Middle Ring or Sleeve).

D. American Water Works Association (AWWA)

1. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
2. AWWA C213—Fusion-Bonded Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
3. AWWA C219—Bolted Sleeve-Type Couplings for Plain-End Pipe.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 METALLIC QUICK-CONNECT COUPLINGS

A. Type 6: Quick-connect couplers shall be female-coupler/female-thread type with locking handles. Provide dust plug and security chain with each coupler. Bodies

and locking handles shall be Type 316 stainless steel. The gasket shall be Teflon. Couplers shall be CIVACON Kamlok 633-D/634-A, Evertite Part D/DP, or equal.

B. Type 8: Quick-connect couplers shall be male-adapter/female-thread type. Provide dust cap and security chain with each coupler. Bodies and locking handles shall be Type 316 stainless steel. The gasket shall be Teflon. Adapters shall be CIVACON Kamlock 633-A/634-B, Evertite Part A/DC, or equal.

C. Type 10: Quick-connect couplers shall be male-adapter/hose-shank type. Provide dust cap with each coupler. Bodies and dust caps shall be Type 316 stainless steel. The gasket shall be Teflon. Adapters shall be CIVACON Kamlok 633-E/634-B, Evertite Part C/DC, or equal.

2.02 COUPLINGS FOR METALLIC PIPING

A. General

1. Thrust Ties: The Contractor shall provide thrust ties where shown and where required to restrain the force developed by 12 times the maximum operating pressure specified.

    a. Steel Pipe: Attach with fabricated lugs.
    b. Ductile Iron Pipe: Attach with bell hanger and wedge restraint glands for buried mechanical joint and push-on joint piping; and thrust retention plates and tie-rods, nuts, washers, and bolts for exposed, flanged piping.

2. Exposed Installations: Zinc-plated nuts and bolts. High-strength, low-alloy steel, in accordance with AWWA C111/A21.11, may be substituted for use on cast-iron and ductile-iron couplings.

3. Buried and Submerged Installations: Provide Type 304 stainless steel tie rods, bolts, and nuts and assemble with an anti-galling compound.

4. Steel Middle Rings and Followers: Fusion-bonded epoxy-lined and coated in accordance with AWWA C213.

5. Restrained couplings or other fittings that use set screws, pointed-end screws to penetrate the outside surface of the pipe for restraint are not acceptable.

B. Flexible Couplings: Coupling shall consist of a steel middle ring or sleeve, two steel or malleable iron flange or follower rings, two wedge-shaped resilient gaskets, and a sufficient number of track-head bolts and nuts.

1. Middle Ring or Sleeve: Steel construction, ASTM A513/A513M, ASTM A635/A635M, or ASME SA675 GR60, fabricated in a true circular section and free of surface defect.

2. Follower Rings or Flanges: Steel construction, AISI C1012 or ASME SA36, fabricated in a true circular section and free of surface defect.

3. Bolts and Nuts: Steel bolt, AWWA C111/A21.22.

4. Gaskets: Grade 27 BUNA-S.

5. Shop Paint: Fusion-bonded epoxy coating.

6. Acceptable Manufacturers:

   a. Dresser Manufacturing Division of Dresser Industries, Inc.
   b. Dresser Styles 38 and 138.
   c. Or approved equal.

C. Transition Couplings: Transition Coupling shall consist of a high-strength steel body, two steel or malleable iron flange or follower rings, a wedge shaped resilient gasket, and a sufficient number of follower bolts.

1. Adapter: Steel construction, ASTM A513/A513M, ASTM A635/A635M or ASME SA675 GR60, free of surface defect.

2. Followers: AISI C1012 or ASME SA36.

3. Bolts: AWWA C 111/ANSI A21.11.

4. Gasket: Grade 27 BUNA-S.

5. Shop Paint: Fusion-bonded epoxy coating.

6. Acceptable Manufacturers:

   a. Dresser Manufacturing Division of Dresser Industries, Inc.; Dresser Styles 62 and 162.
   b. Or approved equal.

D. Flanged Coupling Adapters: Adapters shall consist of a cast-iron or high-strength steel body, two steel or ductile-iron follower rings, a wedge shaped resilient gasket, and a sufficient number of follower bolts.

1. 3- through 12-inch DIP Flange Adapters

a. Adapter: Ductile iron construction, ASTM A536, Grade 65-45-12, free of surface defect. Adapter shall be rated to 200 psi working pressure in accordance with AWWA C219, and -20°F to 212°F.

b. Flanges: Ductile iron construction, ASTM A536, Grade 65-45-12, free of surface defect. Bolt circles and bolt holes shall match those of ASME B16.1 Class 125 flanges.

c. Bolts and nuts: Corrosion-resistant alloy bolts and nuts.

d. Gasket: Grade 27 BUNA-S.

e. Shop paint: fusion-bonded powder epoxy coating.

f. Acceptable Manufacturers:

(1) Dresser Manufacturing Division of Dresser Industries, Inc.; Dresser Style 127.
(2) Or Equal.

2.03 BOLTED SPLIT-SLEEVE AND SINGLE- POINT CLOSURE COUPLINGS

A. Bolted, split-sleeve, and single-point closure couplings shall meet the materials and performance conforming to AWWA C219, which shall be used for steel pipe and stainless steel pipe.

B. When the connecting piping is carbon steel, the coupling shall be manufactured from ASTM A36/A36M carbon steel. When the connecting piping is stainless steel, the coupling shall be manufactured from ASTM A240/A240M Type 316/316L stainless steel.

C. The coupling shall be of the split type with a single-point closure coupling. Provide welded restraint rings on the pipe ends for end restraint. As the coupling closes, it shall confine an elastomeric o-ring type gasket on each pipe end to create a radial seal. The axial seal shall be affected at the closure plates as bolts pull the coupling snug round the pipe.

D. The coupling manufacturer shall provide the restraint rings for each coupling. The Contractor's fabricator shall weld the restraint rings to the pipe in strict accordance with the coupling manufacturer's recommendations.

E. For water service, the elastomeric o-ring type gaskets shall be EPDM (or other material accepted by the Engineer) conforming to ASTM D2000 for the design pressure for the temperature range of -20°F to 180˚F.

F. Type C201 shall be a shouldered, bolted, split-sleeve, fully restrained coupling. Type C201 coupling shall be Depend-O-Lok F x F (Fixed x Fixed), Type 2 manufactured by Victaulic, Depend-O-Lok, Inc., or approved equal.

G. Type C202 shall be a shouldered, bolted, split-sleeve, fully restrained coupling that allows angular deflection of the connecting pipes. Type C202 coupling shall be Depend-O-Lok F x F (Fixed x Fixed), Type 2, Modified manufactured by Victaulic, Depend-O-Lok, Inc., or approved equal.

PART 3 EXECUTION

3.01 INSTALLING QUICK-CONNECT COUPLINGS

A. Attach to piping in accordance with the relevant piping specification.

3.02 INSTALLING COUPLINGS

A. Pipe for use with flexible couplings shall have plain ends as specified in the respective pipe sections in Division 15, Mechanical.

B. Alloy steel bolts and nut for flanged joints shall be made with high-strength, low-alloy Cor-Ten bolts, nuts, and washers. Cor-Ten for mechanical joints shall be made with mild corrosion resistant alloy steel bolts and nuts. All exposed bolts shall be painted the same color as the pipe. All joints to be wrapped with 8-mil color-coded poly wrap.

C. Before sleeve-type couplings are installed, the pipe ends shall be cleaned thoroughly for a distance of 8 inches. Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6 inches from the end, and the middle ring shall be placed on the substantial completion date unless otherwise requested by the Owner.

D. Mechanical joints shall be made in the standard manner. Valve stems shall be vertical in all cases. Set cast-iron box as shown on the Drawings. Boxes shall have sufficient bracing to maintain alignment during backfilling. Knobs on cover shall be parallel to pipe. Remove any sand or undesirable fill from valve box after

installation. Extend tracing wire outside of valve box extension pipe and enter at valve box.

E. Thoroughly clean oil, scale, rust, and dirt from the pipe to provide a clean seat for the gasket.

F. Wipe gaskets clean before installations.

G. Lubricate flexible couplings and flanged coupling adapter gaskets with soapy water or manufacturer's standard lubricant before installing on the pipe ends.

H. Install couplings, service saddles, and anchor studs in accordance with the manufacturer's instruction.

I. Tighten bolts progressively, drawing up bolts on opposite sides a little at a time until all bolts have a uniform tightness.

J. Use torque-limiting wrenches to tighten bolts to the manufacturer's specified torque values.

END OF SECTION

SECTION 15125
PIPING APPURTENANCES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all piping appurtenances as shown on the Drawings and as specified in this Section.

B. All piping appurtenances shall be of the size shown on the Drawings. All equipment of the same type shall be from one manufacturer, unless authorized in writing by the Engineer.

C. All piping appurtenances shall have the name of the manufacturer and the working pressure for which they are designed cast in raised letters upon the body.

D. The piping appurtenances shall include, but not be limited to, the following:

1. Tapping Saddles.
2. Tapping Sleeves and Valves.
3. Pressure Gauge Assembly.
4. Fire Hydrant.
5. Water Meter.
6. Strainers.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product technical submittal data shall contain the following information and data:

1. Acknowledgment that products submitted meet requirements of standards referenced.

2. Manufacturer’s installation instructions.

3. Expansion joints, flexible joints, couplings, adaptors, tapping sleeves, and other appurtenances:

a. Pressure and temperature rating.

b. Materials of construction.
c. Linings.
d. Dimensions and weight.
e. Accessories.
f. Manufacturer's product brochures, cut-sheets, and parts diagrams.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Iron and Steel Institute (AISI)

1. AISI Type 304L—Stainless Steel.
2. AISI Type 316—Stainless Steel, Annealed Sheet.

B. American Society for Testing and Materials (ASTM)

1. ASTM A536—Standard Specification for Ductile Iron Castings.
2. ASTM C285—Standard Test Methods for Sieve Analysis of Wet-Milled and Dry-Milled Porcelain Enamel.

C. American Society of Mechanical Engineers (ASME)

1. ASME B16.5—Pipe Flanges and Flanged Fittings NPS 1/2 through NPS 24 Metric/Inch Standards.

D. American Water Works Association (AWWA)

1. AWWA C105/A21.5—Polyethylene Encasement for Ductile-Iron Pipe Systems.
2. AWWA C153/A21.53—Ductile-Iron Compact Fittings.
3. AWWA C207—Steel Pipe Flanges for Waterworks Service, Sizes 4-Inch through 144-Inch (100 mm through 3,600 mm).
4. AWWA C210—Liquid-Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
5. AWWA C213—Fusion-Bonded Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
6. AWWA C500—Metal-Seated Gate Valves for Water Supply Service.
7. AWWA C502—Dry-Barrel Fire Hydrants.

8. AWWA C700—Standard for Cold-Water Meters—Displacement Type, Metal Alloy Main Case.
9. AWWA C800—Underground Service Line Valves and Fittings.

E. National Sanitation Foundation (NSF)

1. NSF 61—Drinking Water System Components – Health Effects.

1.04 DELIVERY, HANDLING, AND STORAGE

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. All piping appurtenances, unless otherwise directed, shall be loaded and unloaded by lifting, and under no circumstances shall any piping appurtenances be dropped, skidded, or rolled.

C. Slings, hooks, or tongs used for lifting shall be padded to prevent damage to exterior surface or interior linings of piping appurtenances. If any part of the coating, lining, or components is damaged, the Contractor shall make repairs or replacement at his expense and in a manner satisfactory to the Engineer before attempting to install such piping appurtenances.

D. Only new piping appurtenances will be allowed for installation and shall be stored to prevent damage and be kept free of dirt, mud, or other debris.

1.05 QUALIFICATIONS

A. All of the piping appurtenances shall be products of well-established firms that are fully experienced, reputable, have been selling this product for a minimum of 10 years, and qualified in the manufacture of the particular product furnished. The piping appurtenances shall be designed, constructed, and installed in accordance with the requirements and procedures of applicable AWWA standards and shall comply with these Specifications as applicable.

PART 2 PRODUCTS

2.01 TAPPING SADDLE

A. Saddle body shall be made of malleable iron, ductile iron, or bronze. Malleable iron and ductile iron shall be epoxy or nylon coated. Saddles shall be of the single- or multiple-strap design (multiple straps are required for sizes 10 inches and above). The straps shall be made from Type 304 stainless steel or bronze. The

straps shall have a nominal width of 2 inches. Strap studs shall be made from AISI Type 304L stainless steel.

B. Nuts and washers shall be made from Type 304 stainless steel and shall be treated to prevent galling. The straps shall have a curvature accurately formed to meet the diameter of the pipe on which the service saddle is to be installed. A Neoprene gasket shall be securely glued to or imbedded in the body of the clamp to ensure positive sealing against the pipe. Outlet sizes of 3/4 inch and 1 inch shall have female C.C. thread while the outlet for 1-1/2 inches and 2 inches shall be female I.P. thread.

C. Tapping saddles shall not be used on HDPE due to expansion and contraction problems unless specifically approved in writing by the Engineer on a case-by-case basis.

2.02 TAPPING SLEEVES AND VALVES

A. Tapping sleeves and valves shall be designed for a minimum water working pressure of 150 psi and shall be tested at 300 psi. The design shall allow for the insertion of bolts from either side and the internal seal is to be the "O-ring" type. The tapping sleeve shall be furnished complete with bolts, nuts, and gaskets.

B. With the exception of the valve ends and other modifications necessary for tapping service, tapping valves shall conform to AWWA C500 and shall be Mueller "No. T-2360" or approved equal. Each tapping valve shall be provided with a flanged inlet end designed, faced, and drilled for attachment to the outlet flange of the tapping sleeve; an outlet end provided with a tapping flange for attachment of a standard drilling machine; and a mechanical-joint-type bell end for connection of the branch main.

C. Tapping sleeves for 4-inch- through 24-inch-diameter pipe shall be epoxy-coated fabricated-steel construction and manufactured to meet material specification ASTM C285 Grade C for the body. The flange shall conform to AWWA C207 Class D and have an ANSI 150-pound drilling and recessed for tapping valve.

D. Tapping sleeves shall be of the flanged outlet type designed for attachment to the flanged inlet end of the tapping valve and shall be provided with mechanical joint ends at each end of the run. Tapping sleeves shall be Mueller "No. H-615" or approved equal.

2.03 PRESSURE-GAUGE ASSEMBLY

A. Pressure-gauge assemblies shall be provided at locations listed below or as shown on the Drawings. All pressure-gauge assemblies shall include a pressure gauge,

AISI Type 316 stainless steel, NPT threaded ball valves for isolation and venting, and sensor piping. Sensor piping tubing and fittings shall be Type 316 stainless steel. The pressure gauge shall be constructed of Type 316 stainless-steel wetted parts and Type 304 stainless-steel case and bayonet ring, adjustable pointer, laminated safety-glass window, glycerin liquid-filled case, 1.5% span accuracy, and shall have a 2.5-inch-diameter dial size, minimum. The pressure gauge shall be as manufactured by WIKA Instrument Corporation, Type LM 233.54, or approved equal.

B. The Contractor shall furnish and install pressure-gauge assemblies with pressure-gauge ranges as follows and/or shown on the Drawings.

2.04 FIRE HYDRANT

A. Fire hydrants shall be in accordance with AWWA C502, for dry barrel-type fire hydrants. Fire hydrants shall meet the following requirements:

Catalogue and maintenance data	Required.
Type of shutoff	Gate.
Size of hydrant (valve opening)	6-inch.
Inlet connection	6-inch, verify with Drawings.
Outlet nozzles	Two 2.5-inch hose and one 4.5-inch pumper.
Outlet nozzle threads	See Note 1.
Direction to open	Counterclockwise.
Stem seals	O-ring.
Outlet nozzle cap chains	Required.
Drain outlet, non-corrodible	Required.
Traffic breakaway body and valve rod	Required.
Working pressure rating	200 psi (minimum).
Fire hydrant wrenches	Provide five wrenches as spare parts.
Nozzle wrenches	Provide five wrenches as spare parts for each size nozzle provided.
Breakaway repair kit	Provide five kits as spare parts.

Notes

1. Outlet nozzle threads shall be the Owner's standard fire hydrant thread. The Contractor shall verify thread type before submittal.

B. Hydrants shall have Underwriter's Laboratory (UL) and Factory Mutual (FM) approvals. Hydrant exteriors shall be painted with one coat of zinc-chromate alkyd primer and two finish coats of approved paint of the color required by the Owner. Hydrant interiors shall be painted with a paint system approved by NSF

for use in potable water. Working parts shall be bronze. All internal parts shall be removable through the top of the hydrant. Hydrants shall conform to NFPA 24.

C. Fire hydrant extensions shall be provided at no additional cost to the Owner to meet final grade requirements. All hydrants shall stand plumb. No portion of the fire hydrant shall be within 6 inches of a sidewalk. After installation, all hydrants shall be inspected, cleaned, and opened and closed as many times as required to verify that all aspects of the hydrant work properly.

D. Fire hydrants shall be American Darling FHA B-84-B, or equal.

2.05 WATER METER

A. Water meters through 2-inch diameter shall comply with AWWA C700 and NSF 61 standards. Water meters through 6-inch diameter shall comply with AWWA C715 and NSF 61 standards. The meter housing, bottom plates, and trim shall be bronze. The measuring chamber, disc, strainer, generator housing, register lid, and shroud shall be thermoplastic. The magnet shall be ceramic. The disc and magnet spindles shall be stainless steel. External bolts shall be non-corrosive metal.

B. Water meters shall be rated for continuous operation and have a maximum operating pressure of 150 psi. The measuring element shall be a positive displacement mutating disc. An oscillating piston-type meter is not acceptable. The sealed register shall consist of a straight reading, odometer-type totalizing display with a 10,000,000-gallon capacity (minimum) for meters smaller than the 1.5-inch unit and a 100,000,000-gallon capacity (minimum) for the 1.5-inch meter and larger, 360º test circle with center sweep hand, and flow finder to detect leaks. All meters shall have rigid, non-ferrous strainers that are easily removable and have an effective straining area of double that of the main-case inlet.

C. The meters shall have the following minimum characteristics:

Meter Size (inches)	Minimum Test Flow	Normal Test Flow Limits	Pressure Loss @AWWA Max. Cap.	Laying Length (inches)
5/8 x 3/4	1/4 gpm	1/2 – 20 gpm	5.0 psi	7-1/2
3/4 x 3/4	3/8 gpm	3/4 – 30 gpm	7.5 psi	7-1/2 (only)
1	3/4 gpm	1-1/4 – 50 gpm	7.0 psi	10-3/4
1-1/2	1-1/4 gpm	2-1/2 – 100 gpm	7.5 psi	12-5/8 or 13
2	1-1/2 gpm	2-1/2 – 160 gpm	9.0 psi	15-1/4 or 17
6	9 gpm	40 – 800 gpm	2.0 psi	18

D. Water meters up to 2 inches in diameter shall be Badger Recordall Model, Neptune, or approved equal. Water meters greater than 6" in diameter shall be Neptune Mach 10 Ultrasonic or approved equal. Headloss through the meter shall not exceed the published headloss through the named meters at any point on the headloss curve.

E. Water meters larger than 1 inch shall have flanges for inlet and outlet connections; other water meters shall have threaded male inlet and outlet. All meters shall be easily removed from the installed piping.

2.06 STRAINERS

A. Strainers shall be installed where indicated on the Drawings and as specified in this Section. Unless specified otherwise, strainers shall be Y-pattern units with flanged ends and cap, brass or cast-iron body, and stainless steel screens. Screens shall have 40-mesh perforations. Strainers shall be Neptune or approved equal. The blow off from each strainer shall be equipped with a shutoff valve. Blow-down shutoff valves 3/4-inch and smaller shall be provided with male threaded hose adapters. Strainers upstream from double mechanical pump seals shall have 80-mesh screens.

B. A strainer installed in piping immediately upstream from a solenoid valve in water service shall be a Y-pattern unit with brass or bronze body and monel or stainless steel screen. Strainers shall be Neptune or approved equal. The blow off from each strainer shall be equipped with a shutoff valve.

C. A strainer installed in piping immediately upstream from each 2-inch or smaller pressure-reducing valve shall be a Y-pattern unit with bronze, brass, or cast-iron body and monel or stainless steel screen. Strainers shall be Neptune or approved equal. Strainers installed in copper piping shall be of bronze or brass construction. The blow off from each strainer shall be equipped with a shutoff valve.

2.07 TOOLS

A. If required for normal operation and maintenance, special tools shall be supplied with the equipment. Two T-handle wrenches to operate standard 2-inch nuts on buried valves and buried valve actuators shall be provided as part of the work.

PART 3 EXECUTION

3.01 INSTALLATION

A. The Contractor shall install all piping appurtenances as shown on the Drawings.

B. All piping appurtenances shall be installed in the location shown, unless approved otherwise, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the Owner and the Engineer.

C. Install concrete inserts for hangers and supports as soon as forms are erected and before concrete is poured. Before setting these items, the Contractor shall check all plans and figures which have a direct bearing on their location and shall be responsible for the proper location of these piping appurtenances during the construction of the structures.

3.02 SHOP PAINTING

A. Exterior surfaces of ferrous valves and piping appurtenances shall be painted in accordance with Section 09900, Painting and Coating, unless noted or specified otherwise.

3.03 INSPECTION AND TESTING

A. Completed valves and piping appurtenances shall be subjected to hydrostatic pressure test as described in Section 15055, Piping Systems—General, and the detail pipe sections of these Specifications. All leaks in valves and piping appurtenances shall be repaired and lines retested as approved by the Engineer. Before testing, the valves and pipelines shall be supported and thrust restrained for forces in excess of the test pressure to prevent movement during tests.

END OF SECTION

SECTION 15141
DISINFECTION OF PIPING AND WATER STORAGE FACILITIES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section describes requirements for materials and procedures for disinfecting water mains by the continuous feed method and the slug method as well as for disinfecting water storage facilities. The Contractor shall disinfect piping in accordance with Rule 62-555.340, FAC, and AWWA C651 and disinfect water storage facilities in accordance with Rule 62-555.340, FAC, and AWWA C652, except as modified below.

B. Use potable water for chlorination.

C. Submit request for use of water from waterlines of the Owner at least 48 hours in advance.

D. If water for disinfection and/or flushing is supplied from a temporary connection to the existing distribution system, appropriate backflow prevention methods shall be used.

E. Proper disposal of the chlorinated disinfection water and the flushing water is the Contractor's responsibility. Disinfected water shall be neutralized in accordance with AWWA C651 and C652 before discharge.

F. Before permit review and coordination with the Owner and appropriate regulatory authorities (i.e., FDEP and Pasco County Health Department), the Contractor shall provide a schedule for the rate of flow and locations of discharges for the disinfection of piping and water storage facilities. The neutralized discharge water shall be disposed of by discharging to the nearest sanitary sewer (check with the Owner) to the local stormwater system through on-site swales or by other approved means. Discharge to the local stormwater system shall be routed to avoid swale overflow and/or erosion. The Contractor shall be responsible for any damage that occurs related to the discharging process. The Contractor shall repair or replace any damage caused by discharging to the Owner’s satisfaction at no additional expense to the Owner.

G. It is the responsibility of the Contractor to implement and enforce strict adherence to safety guidelines which are addressed in AWWA C651 and C652 as well as safety and handling instructions from the manufacturer. The Contractor shall

comply with all applicable national, state, and local safety regulations and requirements, including OSHA.

1.02 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Water Works Association (AWWA)

1. AWWA B300—Hypochlorites.
2. AWWA B301—Liquid Chlorine.
3. AWWA C651—Disinfecting Water Mains.
4. AWWA C652—Disinfection of Water – Storage Facilities.

B. Florida Administrative Code (FAC)

1. FAC 62-555.340—Disinfection and Bacteriological Evaluation of Public Water System Components.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.05 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 LIQUID CHLORINE

A. Liquid chlorine shall conform to AWWA B301 and shall be applied in strict accordance with AWWA C651 and AWWA C652.

2.02 CALCIUM HYPOCHLORITE (DRY)

A. Calcium hypochlorite shall conform to AWWA B300 and shall be applied in strict accordance with AWWA C651 and AWWA C652. Calcium hypochlorite intended for swimming pool chlorination shall not be used under any circumstances.

2.03 SODIUM HYPOCHLORITE (SOLUTION)

A. Sodium hypochlorite shall conform to AWWA B300 and shall be applied in strict accordance with AWWA C651 and AWWA C652.

2.04 CHLORINE RESIDUAL TEST KIT

A. For measuring chlorine concentration, the Contractor shall supply and use a medium-range, drop count, DPD drop dilution method kit in accordance with AWWA C651 and AWWA C652. Maintain kits in good working order available for immediate test of residuals at point of sampling.

PART 3 EXECUTION

3.01 GENERAL DISINFECTION PROCEDURE

A. Before disinfection, the Contractor shall inspect materials for quality. The Contractor shall use materials and equipment that are appropriate for the disinfection methods selected. The Contractor shall observe the precautionary guidelines given in AWWA C651 and C652.

B. During construction, the Contractor shall take preventative measures in accordance with AWWA C651 to protect materials from contamination.

C. Hydrostatic testing shall be successfully performed before disinfection.

D. Before disinfection, the Contractor shall clear water mains and water storage facilities of foreign debris:

1. Pipelines which are less than 24 inches in diameter shall be flushed, while pipelines which are greater than 24 inches in diameter may be cleared via broom-sweeping in accordance with AWWA C651 and as specified in Section 15144, Pressure Testing of Piping. Sweepings shall be removed from pipeline before the disinfection process begins.
2. Water storage facilities shall be cleared of all materials that are not part of the structural or operating facilities of the tank and shall be cleared of all

debris in accordance with AWWA C652. After the water storage facility has been cleaned, all screened openings shall be inspected for quality of materials and adequate condition to prevent the entry of insects, birds, and other possible contaminants into the tank. The Contractor shall properly disinfect any materials that enter the tank after cleaning in accordance with AWWA C652 before placement in the tank.

E. In accordance with AWWA C651 and C652 procedures, the Contractor shall disinfect all newly constructed materials and existing materials which may have been contaminated during construction. The Contractor shall provide adequate documentation that the required disinfection level (i.e., required chlorine residual and contact time) was successfully achieved.

F. In accordance with Rule 62-555.340, FAC, following disinfection the total chlorine residual in the water mains and water storage facilities shall be reduced to 4 mg/L. The chlorine residual may be reduced via flushing with potable water or by a neutralizing agent that conforms to AWWA C651 and C652.

G. After the total chlorine residual has been reduced to 4 mg/L, the Contractor shall conduct bacteriological testing for water mains and water storage facilities. Bacteriological sampling and testing shall be performed in accordance with Rule 62-555.340, FAC.

H. The Contractor shall dispose of residue from cleaning and other construction operations as well as water from dewatering operations in a manner satisfactory to FDEP and the Pasco County Health Department.

3.02 CONTINUOUS-FEED METHOD FOR PIPELINES

A. Continuous-feed disinfection shall be performed in accordance with AWWA C651. The Contractor shall introduce potable water into the pipeline at a constant measured rate. Feed the chlorine solution into the same water at a measured rate. Proportion the two rates so that the free chlorine concentration in the pipeline is maintained at a minimum concentration of 25 mg/L. Inject chlorine into the main at a point no greater than 3 feet downstream of the start of the new water main. Using the appropriate test kits specified by AWWA C651, the Contractor shall check the concentration at points downstream during the filling to ascertain that sufficient chlorine is being added. The water main shall be completely filled with chlorinated water. The chlorine contact time shall be at least 24 hours. The water shall be chlorinated so that after 24 hours the concentration of free chlorine residual in the water main shall be not less than 10 mg/L.

3.03 SLUG METHOD FOR PIPELINES

A. The Contractor shall perform slug method disinfection in accordance with AWWA C651. Introduce the water in the pipeline at a constant measured rate. At a point no greater than 3 feet downstream of the start of the new water main, feed the chlorine solution into the pipeline at a measured rate so that the free chlorine concentration created in the pipeline is 100 mg/L. Using the appropriate test kits specified by AWWA C651, the Contractor shall check the concentration at points downstream during the filling to ascertain that sufficient chlorine is being added. Feed the chlorine for a sufficient period to develop a solid column or "slug" of chlorinated water that will, as it passes through the line, expose all interior surfaces to a concentration of at least 100 mg/L for at least 3 hours.

3.04 DISINFECTION OF VALVES, BLIND FLANGES, AND APPURTENANCES

A. During the period that the chlorine solution is in the pipeline or as the slug comes into contact with hydrants and valves, open and close valves at least three times to obtain a chlorine residual at hydrants and other pipeline appurtenances. Swab exposed faces of valves and blind flanges before bolting flanges in place with a 1% sodium hypochlorite solution.

3.05 DISINFECTION OF CONNECTIONS TO EXISTING PIPELINES

A. The Contractor shall disinfect isolation valves, pipe, and appurtenances in accordance with AWWA C651, Section 4.7. Flush with potable water until discolored water, mud, and debris are eliminated. Swab interior of pipe and fittings with a 1% sodium hypochlorite solution. After disinfection, flush with potable water again until water is free of chlorine odor.

3.06 CONFIRMATION OF RESIDUAL

A. After the chlorine solution applied by the continuous feed method has been retained in the pipeline for 24 hours, the Contractor shall confirm that a free chlorine residual of 10 mg/L minimum exists along the pipeline by sampling at air valves and other points of access, such as tapping valves.

B. With the slug method, confirm by sampling as the slug passes each access point and as it leaves the pipeline that the free chlorine concentration in the slug is at least 50 mg/L. If the free chlorine residual is less than 50 mg/L, the flow shall be stopped and the slug residual concentration shall be increased to 100 mg/L before disinfection may resume.

3.07 PIPELINE FLUSHING

A. After confirming the free chlorine residual and sufficient contact time, the Contractor shall flush the excess chlorine solution from the pipeline until the free chlorine concentration in the water leaving the pipe is no higher than 4 mg/L.

3.08 BACTERIOLOGICAL SAMPLING AND TESTING

A. In accordance with Rule 62-555.340, FAC, the Contractor shall collect and deliver required samples to a certified laboratory and obtain a bacteriologic quality test to demonstrate the absence of coliform organisms in each separate section of the pipeline and in each structure after chlorination and refilling. Samples shall be delivered to a certified laboratory within 6 hours of sampling:

1. For water mains, collect at least one set of samples from every 1,200 feet of the new water main, plus one set from the end of the line and at least one set from each branch. At each connection to an existing pipeline, take two additional samples.
2. The Contractor shall take care in the sampling of water storage facilities to ensure that the water sampled is representative of the facility. To obtain a representative sample, the storage facility shall be sampled from a tap connected directly to the storage facility or at a sample tap located on the outlet piping.

B. The Contractor shall take chlorine residual samples at the time bacteriological samples are taken. If the chlorine residual is greater than 4 mg/L, the bacteriological test shall be considered invalid and the residual shall be reduced to 4 mg/L and the bacteriological testing shall be performed until the required criteria are satisfied.

C. In accordance with AWWA C652, the Contractor shall test the water in the storage facility to ensure that no offensive odor has been imparted from the disinfection process.

3.09 REPETITION OF PROCEDURE

A. If the initial chlorination fails to produce required residuals and bacteriologic tests, the Contractor shall repeat the chlorination and testing until satisfactory results are obtained.

B. If the water main is installed before satisfactory bacteriological results are achieved, a precautionary boil water notice must be issued if recommended by the water supplier or if recommended by the Florida Department of Health's

"Guidelines for the Issuance of Precautionary Boil Water Notices" in accordance with Rule 62-555.340, FAC.

3.10 TEST FACILITY REMOVAL

A. After satisfactory disinfection, the Contractor shall disinfect and replace air valves, restore the pipe coating, and complete the pipeline where temporary disinfection or test facilities were installed.

3.11 PIPING TO BE DISINFECTED

A. Disinfect all piping as indicated on the Piping Schedule on the Drawings.

3.12 DISINFECTION OF STRUCTURES (NOT USED)

END OF SECTION

SECTION 15144
PRESSURE TESTING OF PIPING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section specifies the hydrostatic, pneumatic, and leakage testing of pressure piping for pumping stations, wastewater treatment plants, water treatment plants, and other facilities; water distribution and transmission mains; and raw sewage force mains and lift stations.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Test bulkhead locations and design calculations, pipe attachment details, and methods to prevent excessive pipe wall stresses.

B. Six copies of the test records to the Engineer upon completion of the testing.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Water Works Association (AWWA)

1. AWWA C600—Installation of Ductile Iron Mains and Their Appurtenances.
2. AWWA C605—Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings.
3. AWWA C906—Polyethylene (PE) Pressure Pipe and Fittings, 4-Inch through 63-Inch (100 mm through 1,650 mm), for Waterworks.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 TEST PRESSURES

A. Test pressures for the various services and types of piping are shown in the Piping Schedule in the Drawings. At a minimum, the Contractor shall perform pressure and leakage test at 1.5 times the maximum system pressure or 100 psi, whichever is greater (based on the elevation or the lowest point of the section under test and corrected for gage location).

1.07 TESTING RECORDS

A. The Contractor shall provide records of each piping installation during the testing. These records shall include the following information:

1. Date and times of test.
2. Identification of process, pipeline, or pipeline section tested or retested.
3. Identification of pipeline material.
4. Identification of pipe specification.
5. Test fluid.
6. Test duration.

B. Test pressure at low point in process, pipeline, or pipeline section.

C. Remarks: Leaks identified (type and location), types of repairs, or corrections made.

D. Certification by the Contractor that the leakage rate measured conformed to the Specifications.

1.08 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 VENTS AND DRAINS FOR ABOVEGROUND PIPING

A. The Contractor shall install vents on the high points of aboveground piping, whether shown in the Drawings or not. Install drains on low points of aboveground piping, whether shown in the Drawings or not. Provide a valve at each vent or drain point. Valves shall be 3/4 inch for piping 3 inches and larger and 1/2 inch for piping smaller than 3 inches. Valves shall be ball or gate valves unless otherwise shown on the Drawings. Valves shall be rated for the pressure of the adjacent piping and shall be suitable for use with the adjacent pipe material.

2.02 MANUAL AIR-RELEASE VALVES FOR BURIED PIPING

A. The Contractor shall provide temporary manual air-release valves at test bulkheads for pipeline test. Construct the pipe outlet in the same manner as for a permanent air valve and, after use, seal with a blind flange, pipe cap, or plug and coat the same as the adjacent pipe.

2.03 TEST BULKHEADS

A. The Contractor shall design and fabricate test bulkheads in accordance with Section VIII of the ASME Boiler and Pressure Vessel Code. Materials shall comply with Part UCS of the code. Design pressure shall be at least 2.0 times the specified test pressure for the section of pipe containing the bulkhead. Limit stresses to 70% of yield strength of the bulkhead material at the bulkhead design pressure. Include air-release and water drainage connections.

2.04 TESTING FLUID

A. The Owner will provide a source of supply from the existing treated water distribution system for the Contractor’s use in filling the lines. An air-break shall be maintained at all times between the Owner’s distribution system and the Contractor’s equipment to prevent cross-connection. The line shall be slowly filled with water and the specified test pressure shall be maintained in the pipe for the entire test period by means of a pump furnished by the Contractor. Provide accurate means for measuring the quantity of water required to maintain this pressure. The amount of water required is a measure of the leakage.

B. Testing fluid shall be potable water unless a pneumatic test is indicated on the Piping Schedule.

C. For fuel oil piping, use potable water for hydrostatic testing and flushing.

D. For potable water pipelines, obtain and use only potable water for hydrostatic testing.

E. Submit request for use of water from waterlines of the Owner 48 hours in advance.

F. The Contractor shall provide back flow prevention control for temporary connections to existing water mains.

2.05 TESTING EQUIPMENT

A. The Contractor shall provide calibrated pressure gauges, pipes, bulkheads, pumps, compressors, chart recorder, and meters to perform the hydrostatic testing. The Contractor shall provide any necessary assistance required for testing.

PART 3 EXECUTION

3.01 TESTING PREPARATION

A. Pipes shall be in place, backfilled, and anchored before beginning pressure testing.

B. The Contractor shall conduct pressure tests on exposed and aboveground piping after the piping has been installed and attached to the pipe supports, hangers, anchors, expansion joints, valves, and meters.

C. For buried piping, the pipe may be partially backfilled and the joints left exposed for inspection during an initial leakage test. However, perform the final pressure test after completely backfilling and compacting the trench.

D. Provide any temporary piping needed to carry the test fluid to the piping that is to be tested. After the test has been completed and demonstrated to comply with the Specifications, disconnect and remove temporary piping. Do not remove exposed vent and drain valves at the high and low points in the tested piping; remove any temporary buried valves and cap the associated outlets. Plug taps or connections to the existing piping from which the test fluid was obtained.

E. Provide temporary drain lines needed to carry testing fluid away from the pipe being tested. Remove such temporary drain lines after completing the pressure testing.

F. Before starting the test, the Contractor shall notify the Engineer and the Owner's Representative.

3.02 CLEANING

A. Before conducting hydrostatic tests, the Contractor shall flush pipes with water to remove dirt and debris. For pneumatic tests, blow air through the pipes. Maintain a flushing velocity of at least 3 fps for water testing and at least 2,000 fpm for pneumatic testing. Flush pipes for the period given by the formula

$$T = \frac{2L}{3}$$

in which:

T = flushing time (seconds)
L = pipe length (feet).

B. For pipelines 24 inches or larger in diameter, acceptable alternatives to flushing are use of high-pressure water jet, sweeping, or scrubbing. Water, sediment, dirt, and foreign material accumulated during this cleaning operation shall be discharged, vacuumed, or otherwise removed from the pipe.

3.03 TESTING AND DISINFECTION SEQUENCE FOR POTABLE WATER PIPING

A. Perform required disinfection after hydrostatic testing, unless otherwise indicated.

B. Disinfection shall be performed as described in Section 15141, Disinfection of Piping and Water Storage Facilities.

3.04 LENGTH OF TEST SECTION FOR BURIED PIPING

A. The maximum length of test section for buried pipe of 12 inches or smaller in diameter is 3,500 feet; for buried pipe larger than 12 inches, 1 mile. Provide intermediate test bulkheads where the pipeline length exceeds these limits.

3.05 INITIAL PIPELINE FILLING FOR HYDROSTATIC TESTING

A. The maximum rate of filling shall not cause the water velocity in the pipeline to exceed 1 fps. Filling may be facilitated by removing automatic air valves and releasing air manually.

3.06 TESTING NEW PIPE WHICH CONNECTS TO EXISTING PIPE

A. Before testing new pipelines that are to be connected to existing pipelines, the Contractor shall isolate the new line from the existing line by test bulkheads,

spectacle flanges, or blind flanges. After the new line has been successfully tested, remove test bulkheads or flanges and connect to the existing piping.

3.07 HYDROSTATIC TESTING OF ABOVEGROUND OR EXPOSED PIPING

A. Open vents at high points of the piping system to purge air while the pipe is being filled with water. Venting during system filling may also be provided by temporarily loosening flanges.

B. Subject the piping system to the test pressure indicated on the Piping Schedule in the Drawings. Maintain the test pressure for a minimum of 2 hours. Examine joints, fittings, valves, and connections for leaks. The piping system shall show zero leakage or weeping. Correct leaks and retest until zero leakage is obtained.

3.08 HYDROSTATIC TESTING OF BURIED PIPING

A. Where any section of the piping contains concrete thrust blocks or encasement, the Contractor shall not make the pressure test until at least 10 days after the concrete has been placed. When testing mortar-lined or PVC piping, fill the pipe to be tested with water and allow it to soak for at least 24 hours to absorb water before conducting the pressure test.

B. Apply and maintain the test pressure by a positive displacement hydraulic force pump.

C. Maintain the test pressure for the 2 hours by restoring the pressure whenever it falls 5 psi.

D. After the test pressure is reached, use a meter to measure the additional water added to maintain the pressure. This amount of water is the loss due to leakage in the piping system. The allowable leakage volume is defined by the formulas:

PVC Pipe:

$$L = \frac{ND(P)^{1/2}}{C}$$

in which:

L = allowable leakage (gallons)
N = number of rubber-gasketed joints in the pipe tested
D = diameter of the pipe (inches)
P = specified test pressure (psig)
C = 7,400

Ductile Iron Pipe:

$$L = \frac{SD(P)^{1/2}}{C}$$

in which:

L = allowable leakage (gallons)
S = length of pipe tested (feet)
D = diameter of the pipe (inches)
P = specified test pressure (psig)
C = 133,200

HDPE Pipe: As specified in Section 15146, High-Density Polyethylene (HDPE) Pipe.

E. The leakage test shall be a separate test following the pressure test and shall not be less than 2 hours long. All leaks evident at the surface shall be repaired and leakage eliminated regardless of the total leakage as shown by test. Lines that fail to meet tests shall be repaired and retested as necessary until test requirements are complied with. Defective materials, pipes, valves, and accessories shall be removed and replaced.

F. The allowable leakage for buried piping having threaded, brazed, or welded (including solvent welded) joints shall be zero.

G. Submit plan for testing to the Engineer for review at least 10 days before starting the test.

H. Peening shall not be used to repair pinhole leaks in welded pipes. Any leakage in welded pipes shall be repaired by appropriate welding techniques.

I. Repair and retest any pipes showing leakage rates greater than that allowed in the criteria above.

3.09 HYDROSTATIC FLUSHING AND TESTING OF FUEL OIL PIPING

A. Flush pipes with water to remove dirt and debris. Remove loose foreign material such as scale, sand, weld spatter particles, and cutting chips from the inside of piping assemblies. Hammer on the outside of steel piping with a nonmarring hammer to aid in freeing weld spatter, scale, and dirt.

B. Perform hydrostatic pressure testing as described previously.

C. After successfully completing the pressure testing, blow out the piping with clean, dry air having a dewpoint of at least -40°F. Circulate the air through the piping system until the exiting air has the same dewpoint as the applied air.

3.10 PRESSURE TESTING OF DOUBLE-WALLED CONTAINMENT PIPING

A. Test the primary pipe as described for buried and above-ground or exposed piping.

B. Test the secondary containment piping by performing a pneumatic test as described above of the annular space between the primary and secondary pipes at a pressure of 5 psi.

3.11 REPETITION OF TEST

A. If the actual leakage exceeds the allowable leakage, locate and correct the faulty work and repeat the test. Restore the work and all damage resulting from the leak and its repair. Eliminate visible leakage.

3.12 BULKHEAD AND TEST FACILITY REMOVAL

A. After a satisfactory test, the Contractor shall remove the testing fluid, remove test bulkheads and other test facilities, and restore the pipe coatings/linings.

END OF SECTION

SECTION 15146
HIGH-DENSITY POLYETHYLENE (HDPE) PIPE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Description: The Contractor shall provide all materials and incidentals, including piping, molded and ductile iron fittings, flanged adapters, flanged joints, mechanical joint adapters, hardware, and appurtenances for the HDPE piping systems shown on the Drawings and the Drawing Process Flow Identification.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance, and Section 15055, Piping Systems—General.

A. In general, shop drawings and related manufacturer's product certification shall be made in accordance with the General and Special Conditions of the Contract for approval before the manufacturer constructs or fabricates the material. The following items, which require shop drawings, are brought to the Contractor's attention. The list may not include all items for which shop drawing submittals are required to meet the requirements of the project.

1. Detail drawings of all classes of pipe, joints, and fittings.
2. Detail Drawings of all joints, including manufacturer's certified factory and/or laboratory test reports to confirm thrust-restraint capacities and restraining mechanism application.
3. Existing piping connection details.
4. Adapters for connection to mechanical joint valves and ductile iron pipe fittings.

B. Certification and test reports for the materials, manufacturing, and testing of the types of pipe supplied shall be furnished by the HDPE pipe manufacturer for the manufacturer's own products in accordance with the latest standards of the industry as described in this Section.

C. Provide a statement in writing from the HDPE pipe manufacturer that the manufacturer is listed with the Plastic Pipe Institute as a qualified extruder for the polyethylene resin to be used in the manufacture of the pipe for this project.

D. All persons making heat fusion joints shall receive training in the manufacturer's recommended procedures. The Contractor shall maintain records of trained

personnel and certify that training was received not more than 12 months before construction began. Additionally, the Contractor shall have worked on one or more projects involving combined installation of at least 10,000 feet of HDPE butt-fusion-welded pipe and shall provide the Engineer with a written list of HDPE pipeline installation experience, including project location, date, Owner, and personnel assigned and installing on this project.

E. The pipe manufacturer shall certify in writing that the Contractor is qualified to join, lay, and pull the pipe or representative of the pipe manufacturer shall be onsite to oversee all pipe joining. All costs for the manufacturer's representative shall be paid for by the Contractor.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM) Standards

1. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.
2. ASTM D3261—Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
3. ASTM D3350—Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
4. ASTM D4976—Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.
5. ASTM F714—Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter.

B. American Water Works Association (AWWA)

1. AWWA C151/A21.51—Ductile Iron Pipe, Centrifugally Cast, for Water.
2. AWWA C901—Polyethylene (PE) Pressure Pipe and Tubing, 1/2-inch (13 mm) through 3-Inch (76 mm), for Water Service.
3. AWWA C906—Polyethylene (PE) Pressure Pipe and Fittings, 4-Inch through 63-Inch (100 mm through 1,650 mm), for Waterworks.

C. International Organization for Standardization (ISO)

1. ISO 9001—Quality Management Systems – Requirements.

1.04 QUALITY ASSURANCE

A. The pipe and fitting manufacturer(s) shall have an established quality-control program responsible for inspecting incoming and outgoing materials. Incoming polyethylene materials shall be inspected for density, melt flow rated, and contamination. The cell classification properties of the material shall be certified by the supplier and verified by the manufacturer's quality control.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, and Section 15055, Piping Systems—General, for storing and protecting the items specified in this Section.

1.07 TESTING REQUIREMENTS

A. See Section 15144, Pressure Testing of Piping.

1.08 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 PIPE AND FITTINGS

A. General

1. All HDPE shall be DriscoPlex PE4710 (PE3408) HDPE; or approved equal.
2. All HDPE pipe 4 inches in diameter or greater shall have a Ductile Iron Pipe outside diameter, and HDPE pipe 3 inches in diameter and smaller shall be IPS unless otherwise specified or shown in the Drawings.
3. All HDPE piping system components shall be the products of one manufacturer.
4. Pipe and fittings shall be manufactured by an ISO 9001-certified manufacturer.

B. HDPE Pipe

1. HDPE pipe 4 inches in diameter and larger shall conform to material standard ASTM D3350 345434 E cell classification rated as PE4710 (PE3408) by the Plastics Pipe Institute. Minimum pressure rating shall be in accordance with Piping Schedule Drawing or as specified in this Section. Minimum pressure rating for HDPE pipe used at directional drilling crossings shall be 160 psi SDR 11 (Standard Dimension Ratio).
2. The polyethylene compound shall be suitably protected against degradation by ultraviolet light.
3. The maximum allowable hoop stress shall be 800 psi at 73.4ºF.
4. The pipe manufacturer shall be listed with the Plastic Pipe Institute as meeting the requirements of the resin manufacturer to manufacture pipe from the resin used.

C. Fittings

1. The pipe manufacturer shall mold or fabricate the polyethylene fittings. Butt fusion outlets shall be made to the same outside diameter, wall thickness, and tolerances as the mating pipe. All fittings and custom fabrications shall be fully rated for the same internal pressure as the mating pipe.

    a. Molded Fittings: Molded fittings shall be manufactured in accordance with ASTM D3261 and shall be so marked. Each production lot of molded fittings shall be subjected to the test required under ASTM D3261. The manufacturer shall submit samples from each molded fitting production lot to x-ray inspection for voids and shall certify that voids were not found.

        (1) Polyethylene Flange Adapters: Flange adapter shall be made with sufficient throughbore length to be clamped in a butt fusion joining machine without the use of a subend holder. The sealing surface of the flange adapter shall be machined with a series of small v-shaped grooves to restrain the gasket against blow-out. Flange adaptors shall be fitted with ductile-iron backup rings pressure rated equal to or greater than the mating pipe. The Contractor shall provide flat ring-type Viton gaskets with gasket thickness and hardness as recommended by the pipe manufacturer for use with HDPE flanged joints. Provide carbon steel hardware (bolts, nuts, washers, etc.) conforming to ASTM A307, Grade B for use with the flange adapters assemblies in accordance with the pipe manufacturer’s

recommendations. Gaskets shall be made from material suitable for exposure to the liquid within the pipe.

b. Fabricated Fittings: Fabricated fittings shall be made by heat fusion joining specially machined shapes cut from pipe, polyethylene sheet stock, or molded fittings. Fabricated fittings shall be rated for internal pressure service equivalent to the full-service pressure rating of the mating pipe. Pressure de-rated fittings are not acceptable. Directional fittings 16 inches IPS and larger, such as elbows, tees, crosses, etc., shall have a plain end inlet for butt fusion and flanged directional outlets.

2. D.I./HDPE Mechanical Joint Adaptors.

a. The manufacturer of the HDPE pipe shall supply all D.I./HDPE mechanical joint adaptors and accessories required to connect plain-end HDPE piping to mechanical joint fittings, valves, and appurtenances.

b. The D.I./HDPE mechanical joint adaptor shall consist of:

(1) A molded or fabricated HDPE mechanical joint transition fitting.
(2) A Buna-N gasket for a D.I. mechanical joint.
(3) A ductile iron mechanical joint backup drive ring.
(4) Cor-Ten mechanical joint tee bolts.
(5) A stainless-steel sleeve stiffener molded or fabricated within the MJ end of the HDPE mechanical joint adaptor fitting.

c. The D.I./HDPE mechanical joint adaptor shall be connected to the HDPE pipe by a heat-fused joint on one end and connected to a ductile iron pipe valve, fitting, or appurtenance with the internally stiffened mechanical joint end.

d. The tee bolts and backup drive ring shall act as a joint restraint for connections to mechanical joints.

e. The HDPE mechanical joint adaptor fitting shall be molded or fabricated by the manufacturer of the HDPE pipe. All molded fittings shall be fully pressure rated to match the SDR pipe pressure rating. Fabricated fittings shall be rated for internal pressure service equivalent to the full pressure rating of the mated IPS pipe.

f. If rework compounds are required, only those generated in the manufacturer's own plant from resin compounds of the same class and type from the same raw material supplier shall be used.

g. Solvent epoxy cementing and mechanical joining with bolt on wrap-around clamps shall not be used.

3. Ductile-iron fittings connected to SDR 11 HDPE pipe (4 inches and larger) shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.

D. HDPE Pipe Jointing Method

1. HDPE pipe shall be jointed by butt fusion in accordance with the pipe manufacturer's directions and only for pipe within one SDR ratio of each other.
2. For SDR ratios that are two or more apart (i.e., SDR 21 to an SDR 11), the joint shall be made using a restrained joints. Same-diameter pipe may be joined by using HDPE flange adapters and backup rings bolted to each other.
3. All HDPE pipe joined by butt fusion shall be made from the same class and type of raw material made by the same raw material supplier.
4. *Butt fusion* means the butt joining of the pipe by heat fusion aligned faces of the pipe ends (butts) in a suitable apparatus and joining under controlled pressure and alignment.
5. The external bead resulting from the butt-fusion process shall be visible and examined for complete butt-fusion 360^{o} around the pipe exterior.
6. Short spools of pipe between valves and fittings shall be ductile iron pipe, with all joints restrained for sizes 4 inches and larger. For 2-inch, the spool shall be Schedule 40 Type 304 stainless steel piping or Schedule 80 PVC piping with IP threads stainless steel or PVC fittings and all joints restrained.
7. Where approved by the Engineer, the HDPE pipe and fittings may be fused with Electrofusion Couplings, as manufactured by Central Plastics Company, or approved equal. Technical information must be provided to demonstrate that the fused coupling will not compromise the structural integrity of the HDPE pipe.

2.02 LOCATOR WIRE

A. All HDPE piping shall be installed with two insulated 12-gauge minimum AWG solid strand copper wires for location purposes as specified in Section 15055, Piping Systems—General.

PART 3 EXECUTION

3.01 GENERAL

A. All polyethylene pipe shall be cut, fabricated, joined, and installed in strict conformance with the pipe manufacturer's recommendations. Joining, laying, and pulling of polyethylene pipe shall be accomplished by personnel experienced in working with HDPE pipe.

3.02 LAYING PIPE

A. Joints

1. All HDPE to HDPE pipe joints shall be joined by heat fusion that produces homogeneous, sealed, leak-tight joints.
2. Restrained mechanical joint adaptors shall be provided at tie-ins with valves, ductile iron fittings, and other pipe materials.

B. Butt Fusion Testing

1. The Contractor shall test the first fusion of each day.
2. In testing, the fusion shall be allowed to cool completely and then fusion test straps shall be cut out. The test shall be a minimum of 12 inches or 30 times the wall thickness in length with the fusion in the center and a minimum of 1 inch or 1.5 times the wall thickness in width. Bend the test strap until the ends of the strap touch. The Contractor shall not begin until a fusion test has passed the bent strap test.

C. Pipe Deflection

1. When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane or where long radius curves are permitted, the amount of deflection shall not exceed 75% of that recommended by the manufacturer.

D. Pipe Cutting

1. Cutting HDPE butt fusion connections to HDPE pipe, valves, fittings, or closure pieces shall be done in a neat, workman-like manner without damaging the pipe. Ends shall be cut square and perpendicular to the pipe axis.

3.03 PERFORATED HDPE PIPING INSTALLATION (NOT USED)

3.04 FLUSHING AND CLEANING

A. Flushing and Cleaning shall be as specified in Section 15144, Pressure Testing of Piping.

3.05 TESTING AND LEAKAGE

A. Hydrostatic Tests—General

1. All testing shall comply with Section 15144, Pressure Testing of Piping, except as specified in this Section.

2. All field tests shall be made in the presence of the Owner or Engineer. Except as otherwise directed, all pipelines shall be tested. All piping to operate under liquid pressure shall be tested in sections of approved length, typically from valve to valve and in no case longer than 5,000 feet.

3. Hydrostatic testing shall consist of a combined pressure test and leakage test. The field test pressure shall be as indicated on the Drawing Piping Schedule, measured at the lowest point of the section being tested. The pressure shall be applied by a pump connected to the pipe in a manner satisfactory to the Engineer. The pump, pipe connection, and all necessary apparatus shall be furnished by the Contractor and shall be subject to the satisfaction of the Engineer.

4. The maximum duration for any test, including initial pressurization, initial expansion, and time at test pressure, must not exceed 8 hours. If the test is not completed due to leakage, equipment failure, etc., depressurize the test section and allow it to “relax” for at least 8 hours before bringing the test section up to test pressure again.

5. Monitored Make-Up Water Test: The test procedure consists of initial expansion and test phases.

   a. During the initial expansion phase, the test section is filled with water. Once the line is filled, make-up water is added at hourly intervals as required to maintain the test pressure for 3 hours.
   b. At the end of the initial expansion period, the addition of make-up water will cease. During the test phase, the pipe will not have any water added to it for the following 2 hours. The 2 hours will be the actual leakage test. At the end of the 2-hour period, measured make-up water will be added to the pipe to return it to the original test pressure.

c. If the amount of make-up water added is greater than calculated using the numbers listed below, the section being tested will be considered to have a leak. The leak shall be found and fixed at the Contractor's expense and that section of the line retested before continuing with subsequent leakage tests. Testing and repairs shall be repeated at the Contractor's expense until the amount of make-up water is less than the amount calculated using the numbers listed below.

ALLOWABLE FOR EXPANSION UNDER TEST PRESSURE*
POLYETHYLENE PIPE

Nominal Pipe Size (in.)	Allowances for Expansion (US Gal/100 Feet of Pipe)		
	1-Hour Test	2-Hour Test	3-Hour Test
6	0.30	0.60	0.90
12	1.1	2.3	3.4

These allowances only apply to the test phase and not to the initial expansion phase.

END OF SECTION

SECTION 15155
DUCTILE IRON PIPE AND FITTINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall provide all materials and incidentals, including piping, fittings, flanged joints, mechanical joints, retainer glands, polyethylene bagging for buried ductile iron piping, fittings, valves, and appurtenances for the ductile iron piping systems required for the work shown on the Drawings in the Piping Schedule.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. All ductile iron pipe and fittings to be installed under this Contract shall be inspected and tested at the foundry where the material for this project is manufactured. The Contractor shall submit sworn certificates of such tests and their results.

B. Shop Drawings, including layout drawings, shall be submitted as specified in Section 15055, Piping Systems—General.

C. The Contractor shall submit the pipe manufacturer's certification of compliance with the applicable Sections of the Specifications.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM A193/A193M—Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.

2. ASTM A194/A194M—Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure and High Temperature Service, or Both.
3. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.
4. ASTM A536—Standard Specification for Ductile Iron Castings.
5. ASTM A563—Standard Specification for Carbon and Alloy Steel Nuts.
6. ASTM B117—Standard Practice for Operating Salt Spray (Fog) Apparatus.
7. ASTM C150/C150M—Standard Specification for Portland Cement.
8. ASTM C283—Standard Test Methods for Resistance of Porcelain Enameled Utensils to Boiling Acid.
9. ASTM D714—Standard Test Method for Evaluating Degree of Blistering of Paints.
10. ASTM D792—Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
11. ASTM D1238—Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer.
12. ASTM E96—Standard Test Methods for Water Vapor Transmission of Materials.
13. ASTM G95—Standard Test Method for Cathodic Disbondment Test of Pipeline Coatings (Attached Cell Method).

B. American Society of Mechanical Engineers (ASME)

1. ASME B1.1—Unified Inch Screw Threads (UN and UNR Thread Form).
2. ASME B16.1—Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250.

C. American Water Works Association (AWWA)

1. AWWA C104/A21.4—Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
2. AWWA C110/A21.10—Ductile-Iron and Gray-Iron Fittings.
3. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
4. AWWA C115/A21.15—Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
5. AWWA C150/A21.50—Thickness Design of Ductile-Iron Pipe.
6. AWWA C151/A21.51—Ductile-Iron Pipe, Centrifugally Cast.
7. AWWA C153/A21.53—Ductile-Iron Compact Fittings.
8. AWWA C207—Steel Pipe Flanges for Waterworks Service Sizes, 4-Inch through 144-Inch (100 mm through 3,600 mm).

9. AWWA C600—Installation of Ductile-Iron Mains and their Appurtenances.
10. AWWA C651—Disinfecting Water Mains.

D. International Organization for Standardization (ISO)

1. ISO 9001—Quality Management Systems – Requirements.

E. NSF International (NSF)

1. NSF 61—Drinking Water System Components – Health Effects.

1.04 QUALITY ASSURANCE

A. Source Quality Control

1. The ductile iron pipe manufacturer shall submit certification that the pipe and fitting products meet all tests required by AWWA C151/A21.51.
2. All materials shall be new and have a manufacturer's certificate verifying compliance to all tests and inspections as required in this Section. The weight, class, and casting period shall be shown on each piece of pipe. The manufacturer's "mark," the year produced, and the word "Ductile" or the letters "DI" shall be cast or stamped on all pipe.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 TESTING REQUIREMENTS

A. See Section 15144, Pressure Testing of Piping, for testing requirements.

1.08 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 GENERAL

A. All ductile iron piping shall be designed and manufactured in accordance with AWWA C150/A21.50 and AWWA C151/A21.51 for the following minimum operating conditions:

1. The minimum internal design pressure shall be 150 psi with a 100-psi surge allowance, with a safety factor of 2, for a total internal design pressure of 500 psi.

2. The external loads design criteria shall be for the minimum cover indicated on the Drawings at 120 lb per cubic feet soil weight and live load based on one AASHTO H-20 truck load. The thickness design of ductile iron pipe shall be in accordance with AWWA C150/A21.50.

3. The horizontal deflection of cement-mortar-lined ductile iron pipe resulting from external load conditions shall not exceed 3% of the pipe diameter based on the trench design shown on the Drawings.

4. Pressure Class: All ductile iron piping shall meet the following minimum working pressure classes:

   a. 4 inches through 12 inches: 350 psi.
   b. Pipe greater than 12 inches: 250 psi.

2.02 JOINTS

A. Ductile iron fittings shall be furnished with mechanical joints and flanged joint ends as shown on the Drawings and specified in this Section:

1. Mechanical Joints: All buried ductile iron fittings shall be furnished with mechanical joint ends unless noted otherwise. Mechanical joints shall conform to AWWA C111/A21.11. Glands shall be constructed of ductile iron.
2. Flanged Joints: Pipe for threaded flange fabrication shall be Special Thickness Class 53 in accordance with AWWA C110/A21.10, AWWA C111/A21.11, and AWWA C115/A21.15. Bolt circle and bolt holes shall match those of ASME B16.1 Class 125 flanges. The flanges shall be rated for a maximum working pressure of 250 psi. Threaded flanges shall be individually fitted and machine tightened on the pipe ends. Flange facing shall be smooth or with shallow serrations in accordance with AWWA C115/A21.15.

2.03 FITTINGS

A. General: Ductile iron pipe fittings shall be the compact type meeting the requirements of AWWA C110/A21.10 and AWWA C153/A21.53 where applicable. Ductile iron fittings shall be cement lined and seal coated or epoxy lined. Lining of fitting shall conform to lining specified for piping and service as specified on the Drawing, Flow Stream Identification. Fittings shall be manufactured in accordance with AWWA C110/A21.10. Where taps are shown on fittings, tapping bosses shall be provided. At a minimum, fittings shall have the same pressure rating as the connecting pipe.

1. Flanged Joint: AWWA C110/21.10 and ASME B16.1, faced and drilled 125-pound ANSI standard.

2. Mechanical Joint: AWWA C110/A21.10.

   a. Provide mechanical joint fittings for all buried fittings as shown in the Drawings, unless noted otherwise.
   b. Provide specified gaskets.

2.04 LINING AND COATING

A. The Contractor shall provide lined ductile iron piping and fittings in accordance with the Drawing, Flow Stream Identification. The Contractor shall perform all field measurements confirming the accuracy of the piping sizes and lengths shown on the Drawings. The Contractor shall notify the Engineer immediately before deviating from or altering the lining of ductile iron piping shown on the approved layout schedule.

B. Ceramic Epoxy Lined Pipe and Fittings: The Contractor shall notify the Engineer immediately before cutting epoxy-lined ductile iron pipe in the field. The Contractor shall repair the cut end in accordance with the pipe manufacturer's written procedures.

1. General: The lining shall be an amine-cured novalac epoxy containing at least 20% by volume of ceramic quartz pigment. The lining material shall be Protecto 401 Ceramic Epoxy as manufactured by Induron Protective Coatings, Inc. The lining shall be applied by a competent pipe lining specialty firm with a successful history of applying linings to the interior of ductile iron pipe and fittings.

2. Lining Materials: Lining material shall meet the following requirements and properties:

a. A permeability rating of 0.00 when tested according to Method A of ASTM E96, Procedure A with a test duration of 30 days.

b. The following test shall be run on coupons from lined ductile pipe:

Test Parameter	ASTM Test Method	Typical Value
Salt Spray	B117	0.0 undercutting after 2 years
Cathodic disbondment 1.5 volts @ 77° F	G95	No more than 0.5 mm undercutting after 30 days
Immersion	D714	No effect after 2 years for 20% sulfuric acid, 140°F 25% sodium hydroxide, 160°F distilled water
Immersion	D714	0.0 undercutting after 2 years for 120°F tap water

3. Application: The lining applicator shall apply lining according to the requirements of the Protecto 401 Specification and application methods and procedures.

C. Cement-Lined Ductile Iron Pipe and Fittings: Interior surfaces of all cement-lined ductile iron pipe, fittings, and specials shall be cleaned and lined in the shop with a standard thickness cement-mortar lining applied in conformity with AWWA C104/A21.4, Portland cement mortar. Every precaution shall be taken to prevent damage to the lining. If lining is damaged or found faulty at delivery site, the Contractor shall repair or replace damaged or unsatisfactory portions with lining conforming to these Specifications at no additional cost to the Owner. Pipe linings for potable water lines shall be NSF 61 approved.

1. All ductile iron pipe and fittings cement-mortar linings shall be surface sealed with an asphaltic seal coating, 1 mil, in accordance with AWWA C104/A21.4.

2.05 MANUFACTURERS

A. Acceptable ductile iron pipe manufacturers include US Pipe, American Ductile Pipe, Griffin Pipe, or approved equal.

2.06 BOLTS

A. General: The Contractor shall provide carbon steel, ASTM A307, Grade A hex head bolts and ASTM A563, Grade A hex head nuts. Threads shall be as specified

in ASME B1.1 coarse thread series, Class 2A external and Class 2B internal. Nuts, bolts, and gaskets for flanged fittings and blind flanges shall be designed to withstand the design and test pressure ratings for the pipe.

2.07 GASKETS

A. Gaskets for mechanical joints shall be compatible with potable water or sewage pipe service. See Section 15055, Piping System—General, for gasket requirements.

B. Gaskets for flanged joints shall be 1/8-inch-thick, cloth-inserted rubber conforming to applicable parts of ASME B16.21 and AWWA C207. Gasket material shall be free from corrosive alkali or acid ingredients and suitable for use in sewage and reclaimed water lines. Gaskets shall be full-face type for 125-pound flanges.

2.08 RETAINER GLANDS

A. Retainer glands shall be provided for all buried ductile-iron mechanical joints, fitting, and ductile-iron pipe connections to buried valves. Retainer glands shall be designed for joint retaining through the use of a follower gland and set screw-anchoring devices that impart multiple wedging action against the pipe. The mechanical joint-restraint device shall be UL listed and shall have a working pressure of at least 250 psi with a minimum safety factor of 2.

1. Gland: Manufactured of ductile iron conforming to ASTM A536. Gland dimensions shall match AWWA C111/A21.11 and AWWA C153/A21.53.

2. Restraining Devices: Manufactured of ductile iron heat treated to a minimum hardness of 370 BHN. Restraining devices shall incorporate a set screw/twist-off nut bolt to ensure the proper actuating of the restraining device. The twist-off nut shall be designed to come off at the torque limit desired to anchor the restraining device in place on the pipe.

3. Joint Deflection: Retainer gland joint deflection shall be limited to manufacturer's recommended maximum deflection angle. Joint deflection shall be applied before the set screws are torqued.

4. Acceptable Manufacturers:

    a. EBAA Iron, Inc. – Megalug 1100 Series.
    b. Or approved equal.

2.09 EXTERNAL PIPE RESTRAINTS

A. Ductile iron pipe push-on (bell and spigot) joint restraint shall be provided by a restraining harness consisting of a restraint ring, connecting tie-rods, and split-ring assembly installed at all push-on joints. The restraint ring shall consist of wedging components made from 60-42-12 ductile iron conforming to ASTM A536 and wedges heat treated to minimum 370 BHN. Torque limiting twist-off nuts shall be provided on each wedge to ensure proper applied installation torque. The split ring shall be made from 60-42-12 ductile iron conforming to ASTM A536. The connecting rods shall be made of steel conforming to AWWA C111/A12.11. Sizes 4- to 16-inch-diameter restraining harnesses shall have 350-psi maximum working pressure rating and 18- to 36-inch-diameter restraining harnesses shall have 250-psi maximum working pressure rating. All harnesses shall be designed with a 2-to-1 safety factor applied to the maximum working pressure rating.

B. Acceptable Manufacturers

1. EBAA Iron, Inc. – Series 1700.
2. Or approved equal.

2.10 INTERNAL PIPE RESTRAINT

A. Acceptable Manufacturers

1. American Ductile Iron Pipe:

a. Fast Grip ® Gasket.
b. Flex Ring ® Joint.

2. US Pipe

a. Field Lok ® Gasket.
b. TR Flex Restrained Joint Pipe and Fittings.

3. Or Engineer-approved equal.

2.11 POLYETHYLENE BAGGING

A. Polyethylene bagging for buried ductile iron pipe, fittings, and valves shall be 8 mils thickness minimum polyethylene, manufactured in accordance with ASTM D1238, Type I, Class C, Grade E1.

2.12 COLOR CODING OR MARKING

A. All potable water main pipe, including fittings, shall be color coded or marked using blue as a predominant color to differentiate drinking water from reclaimed or other water. Underground plastic pipe shall be solid-wall blue pipe, shall have a co-extruded blue external skin, or shall be white or black pipe with blue stripes incorporated into or applied to the pipe wall; and underground metal or concrete pipe shall have blue stripes applied to the pipe wall. Pipe striped during manufacturing of the pipe shall have continuous stripes that run parallel to the axis of the pipe, that are located at no greater than 90° intervals around the pipe, and that will remain intact during and after installation of the pipe. If tape or paint is used to stripe pipe during installation of the pipe, the tape or paint shall be applied in a continuous line that runs parallel to the axis of the pipe and that is located along the top of the pipe; for pipes with an internal diameter of 24 inches or greater, tape or paint shall be applied in continuous lines along each side of the pipe as well as along the top of the pipe. Marking tape shall be 3 inches wide with adhesive backing. Paint stripe shall be 3 inches wide. Aboveground pipe at drinking water treatment plants shall be color coded and labeled in accordance with subsection 62-555-320(10), FAC, and all other aboveground pipe shall be painted blue or shall be color coded or marked like underground pipe.

B. All reclaimed water valves and outlets shall be appropriately tagged or labeled bearing the words in English and Spanish. All piping, pipelines, valves, and outlets shall be color coded or otherwise marked to differentiate reclaimed water from domestic or other water. Underground ductile iron pipe shall be color coded or marked using purple as a predominant color. If tape is used to mark the pipe, the tape shall be permanently affixed to the top and each side of the pipe (three locations parallel to the axis of the pipe). For pipes less than 24 inches in diameter, a single tape may be used along the top of the pipe. Visible, aboveground portions of the reclaimed water distribution system shall be clearly color coded or marked.

PART 3 EXECUTION

3.01 HANDLING PIPE AND FITTINGS

A. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe, fitting, lining, and coating. Pipe and fittings shall not be dropped. All pipe and fittings shall be examined before installation, and no piece that the Engineer finds defective shall be installed. The Contractor shall repair any damage to the pipe and fittings coating and/or lining as directed by the Engineer. If the Engineer determines that the coating and/or lining cannot be repaired, the Contractor shall replace the damaged pipe and fittings at no additional compensation.

B. All pipe and fittings shall be subjected to a careful inspection immediately before installation.

C. If any defective pipe is discovered after it has been installed, the Contractor shall remove and replace it with a pipe in satisfactory condition at no additional expense to the Owner.

D. Ceramic epoxy and glass-lined pipe and fittings shall be handled only from the outside of the pipe and fittings. No forks, chains, straps, hooks, etc. shall be placed inside the pipe and fittings for lifting, positioning, or laying.

3.02 PIPE INSTALLATION

A. The Contractor shall provide and use proper implements, tools, and facilities for the safe and convenient performance of the work. All pipe, fittings, valves, and appurtenances shall be lowered carefully into the trench and at above-grade locations to prevent damage to the pipe, protective coating, lining, and polyethylene bagging. Under no circumstances shall pipeline materials be dropped off or dumped. A trench shall be dewatered before the pipe is installed.

B. The Contractor shall carefully examine all pipe fittings, valves, and other appurtenances for damage and other defects immediately before installation and before bagging buried ductile-iron pipe. The Contractor shall mark and hold defective materials for inspection by the Engineer, who may prescribe corrective repairs or reject the materials.

C. The Contractor shall remove all lumps, blisters, and excess coating from the socket and plain ends of push-on joint pipe for buried service. The outside of the plain end and the inside of the bell shall be wiped clean and dry and be free from dirt, sand, grit, or any foreign material before the pipe is laid in trench.

D. The Contractor shall prevent foreign material from entering the pipe while the pipe is being placed in the trench. During installation, no debris, tools, clothing, or other materials shall be placed in the pipe.

E. As each length of buried pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.

F. When pipe is not being laid, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer. When practical, the plug shall remain in place until the trench is pumped completely dry. Care shall be taken to prevent pipe flotation should the trench fill with water.

G. Trench width at the top of pipe, bedding conditions, and backfill placement and compaction shall be such that design loadings on the pipe will not be exceeded.

H. Joint Assembly: Pipe joints shall be assembled in accordance with the manufacturer's instructions and the requirements of AWWA C600.

1. Flanged Joint: Before connecting flanged pipe the Contractor shall thoroughly clean all faces of the flanges of all oil, grease, and foreign material. The rubber gaskets shall be checked for proper fit and thoroughly cleaned. Care shall be taken to ensure proper sealing of the flange gasket. Bolts shall be tightened so that the pressure on the gasket is uniform. Torque-limiting wrenches shall be used to ensure uniform bearing insofar as possible. If joints leak when the hydrostatic test is applied, the gaskets shall be removed and reset and bolts retightened.
2. Push-On, Restrained Joint, or Mechanical Joint: The Contractor shall joint piping in accordance with the manufacturer's recommendations. Provide all special tools and devices, such as special jacks, chokers, and similar items required for proper installation. Lubricant for the pipe gaskets shall be furnished by the pipe manufacturer, and no substitutes will be permitted under any circumstance.

I. Pipe Deflection: When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane or where long radius curves are permitted, the amount of deflection shall not exceed that shown in AWWA C600 and that recommended by the retainer gland manufacturer for mechanical joint pipe and fittings.

J. Pipe Cutting: For inserting valves, fittings, or closure pieces pipe shall be cut in a neat, workmanlike manner without damaging the pipe or lining. Ductile cast iron may be cut using an abrasive pipe saw, rotary wheel cutter, guillotine pipe saw, milling wheel saw, or oxyacetylene torch. Cut ends and rough edges shall be ground smooth, and for push-on joint connections the cut end shall be beveled.

3.03 ABOVE-GROUND PIPE INSTALLATION

A. The Contractor shall install pipe in horizontal or vertical planes, parallel or perpendicular to building surfaces unless otherwise shown. Support pipe and fittings to prevent strain on joints, valves, and equipment. Install flanged joints so that contact faces bear uniformly on the gasket. Tighten bolts in accordance with the pipe manufacturer's recommendations.

3.04 SURFACE PREPARATION AND PAINTING

A. All exposed pipe and fittings shall be painted as specified in Section 09900, Painting and Coating.

B. All buried steel bolts, nuts, washers, rods, harnesses, clamps, sleeves, and appurtenances shall be painted with System No. 21 as specified in Section 09900, Painting and Coating.

3.05 INSPECTION, TESTING, AND DISINFECTION

A. See Section 15055, Piping Systems—General; Section 15141, Disinfection of Piping and Water Storage Facilities; and Section 15144, Pressure Testing of Piping.

END OF SECTION

SECTION 15291
POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND FITTINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to furnish, install, and complete the AWWA C900 DR 18 PVC pipe and ductile iron fittings specified.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. All PVC pipe and fittings to be installed under this Contract shall be inspected and tested at the location where the material for this project is manufactured. The Contract shall submit certificates of such tests and their results.

B. The Contractor shall submit the pipe manufacturer's certification of compliance with the applicable sections of the Specifications.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society of Testing Materials (ASTM)

1. ASTM A242/A242M—Standard Specification for High-Strength Low-Alloy Structural Steel.
2. ASTM A536—Standard Specification for Ductile Iron Castings.
3. ASTM D2241—Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
4. ASTM F477—Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

B. American Water Works Association (AWWA)

1. AWWA C900—Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4-Inch to 12-Inch (100 mm to 300 mm), for Water Transmission and Distribution.
2. AWWA C905—Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14-Inch through 48-Inch (350 mm through 1,200 mm) for Water Transmission and Distribution.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 LARGE PVC PRESSURE PIPE

A. Large PVC Pressure Piping

1. Unless otherwise noted, PVC pressure pipe for nominal diameters 4 inches and larger shall conform to the requirements of AWWA C900 DR 18 up to 12 inches with gasketed integral bell ends. Pipe shall be designed for maximum working pressure of not less than 150 psi. Pipe shall be made to ductile iron pipe ODs instead of IPS. The PVC pipe shall be blue and NSF approved for potable water use and green for sewer main use.

B. Bell and Spigot

1. Pipe joints shall be made with integral bell and spigot pipe ends. The bell shall consist of an integral thickened wall section designed to be at least as strong as the pipe wall. The bell shall be supplied with a factory glued rubber ring gasket that conforms to the manufacturer's standard

dimensions and tolerances. The gasket shall meet the requirements of ASTM F477 "Elastomeric Seals (Gaskets) for Joining Plastic Pipe." PVC joints shall be "Ring-Tite" as manufactured by J-M Manufacturing Company, Inc. or an equal approved by the Engineer. Nontoxic gasket lubricant shall be as specified by the pipe manufacturer.

C. Restrained Joints

1. The following pipe joints and fittings restraint methods can be used to prevent pipe joints and fittings from separating under pressure. No additional financial compensation will be provided to the Contractor for providing the following methods of restraint:

a. C-900 PVC pipe bell and spigot joints (4-inch- through 12-inch-diameter pipe) shall be restrained with the EBAA Iron MEGALUG® Series 1600 Restrainer or an equal approved by the Engineer. The Series 1600 restrainers shall provide a minimum of 150-psi restraint to DR 18 (Class 150) pipe with a 3 to 1 safety factor. The restraining device and tee head bolts shall be manufactured of high-strength ductile iron meeting ASTM A536, Grade 65-42-10. Clamping bolts and nuts shall be manufactured of corrosion-resistant, high-strength, low-alloy CORTEN steel meeting the requirements of ASTM A242/A242M.

b. Mechanical joint fittings used with PVC pipe (3-inch- through 36-inch-diameter DR 18 pipe) shall be restrained with the EBAA Iron MEGALUG® Series 2000 PV Restrainer or an equal approved by the Engineer. The Series 2000 PV restrainers shall provide a minimum of 150-psi restraint with a 2 to 1 safety factor. The restraining device and Tee head bolts shall be manufactured of high-strength ductile iron meeting ASTM A536, Grade 65-42-10. Clamping bolts and nuts shall be manufactured of corrosion-resistant, high-strength, low-alloy CORTEN steel meeting the requirements of ASTM A242/A242M.

c. All parts of the joint restraint systems shall be coated with coal tar epoxy as in Section 09900, Painting and Coating, Mega-Bond coating system by EBAA Iron, Inc. or Engineer-approved equal.

2.02 LARGE PVC PRESSURE PIPE FITTINGS

A. Fittings for use with large PVC pipe shall be ductile-iron fittings conforming to the requirements of mechanical joint fittings as specified in Section 15155, Ductile Iron Pipe and Fittings.

B. Exterior Coating

1. Exterior coating for fittings shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.

C. Lining

1. Lining for fittings shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.
2. Any damaged lined areas shall be repaired in accordance with the manufacturer's recommendations so that the repaired area is equal to the undamaged lined areas.

2.03 SMALL PVC PRESSURE PIPE (NOT USED)

PART 3 EXECUTION

3.01 EXAMINATION

A. The Contractor shall examine pipe and appurtenances shall be examined at the point of delivery. Material found to be defective due to manufacture or damage in shipment shall be rejected. Tests as specified in the applicable material standard may be performed to ensure conformance with the standard.

3.02 PIPE INSTALLATION

A. Proper implements, tools, and facilities shall be provided and used for the safe and convenient performance of the work. All pipe, fittings, and valves shall be lowered carefully into the trench using suitable tools or equipment to prevent damage to pipeline materials. Under no circumstances shall pipeline materials be dropped or dumped into the trench. The trench shall be dewatered before installing the pipe in accordance with the Specifications.

B. The sealing surface of the pipe, the inside of the bell, and the inside of the gasket shall be cleaned immediately before assembly.

C. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. During laying operations, no debris, tools, clothing, or other materials shall be placed in the pipe.

D. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.

E. At all times when pipe laying is in progress, except when joining another piece of pipe, the open ends of the pipe shall be closed by a watertight plug or other means approved by the Engineer to prevent the entrance of objectionable materials. Care shall be taken to prevent pipe flotation.

F. Trench width at the top of the pipe, bedding conditions, and backfill placement and compaction shall be in accordance with the Contract Documents.

G. Joint Assembly

1. Pipe joints shall be assembled in accordance with the manufacturer's instructions.

H. Pipe Deflection

1. When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane, the amount of deflecting shall not exceed 75% of that recommended by the manufacturer.

I. Pipe Cutting

1. Cutting pipe for the insertion of valves, fittings, or closure pieces shall be done in a neat, workman-like manner without creating damage to the pipe. Ends shall be cut square and perpendicular to the pipe axis.
2. Burrs shall be removed from spigots, and ends shall be smoothly beveled. Field cut ends shall be marked for proper depth of joint assembly.

J. Thrust Restraint

1. All pipe, tees, valves, bends, and etc., unless otherwise specified, shall be restrained using mechanical means as specified. Pipe restraint using the specified mechanical restraining system with the restrained joint schedule or tie-rods is also acceptable. Reaction blocking shall not be used on this project.
2. All ductile iron fittings, valves, mechanical restraint harnesses, and other forms of mechanical restraint shall be installed and wrapped in polyethylene tube material as specified in Section 15155, Ductile Iron Pipe and Fittings.

3.03 LOCATION AND IDENTIFICATION

A. All non-metallic potable water and sewer mains shall be installed with a continuous, insulated 14-gauge copper wire installed directly on top of pipe for

location purposes. Detectable tape may be used in lieu of copper wire and shall be placed 1 foot above the top of the pipe.

B. All PVC sewer mains shall be a solid green color. All potable water mains shall be a solid blue color. All lettering shall appear legibly on pipe and shall run the entire length of the pipe. Lettering shall be appropriate for the intended use.

3.04 TESTING

A. All lines shall be tested at the pressures listed in the Piping Schedule in the Drawings.

B. See Section 15144, Pressure Testing of Piping, for the requirements of pipe flushing, cleaning, pressure and leakage testing, and inspection requirements.

C. See Section 15141, Disinfection of Piping and Water Storage Facilities, for the disinfection requirements.

END OF SECTION

APPENDIX A

REPORT OF A GEOTECHNICAL EXPLORATION

Engineering & Consulting, Inc.

SUMMARY REPORT OF A GEOTECHNICAL SITE EXPLORATION

SOUTH 301 W WATER AND WASTEWATER PIPELINES ZEPHYRHILLS, PASCO COUNTY, FLORIDA

GSE PROJECT NO. 16198

Prepared For:

JONES EDMUNDS & ASSOCIATES, INC.

SEPTEMBER 2023

GSE Engineering & Consulting, Inc.

September 8, 2023

Keyla Virgilio, E.I.
Jones Edmunds & Associates, Inc.
730 NE Waldo Road
Gainesville, Florida 32641

Subject: Summary Report of a Geotechnical Site Exploration
South 301 W Water and Wastewater Pipelines
Zephyrhills, Pasco County, Florida
GSE Project No. 16198

GSE Engineering & Consulting, Inc. (GSE) is pleased to submit this geotechnical site exploration report for the above referenced project.

Presented herein are the findings and conclusions of our exploration, including the geotechnical parameters and recommendations to assist with the force main and water main designs.

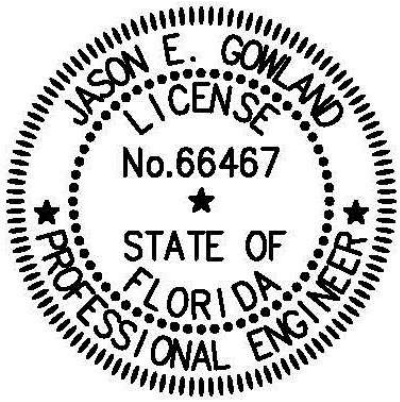
GSE appreciates this opportunity to have assisted you on this project. If you have any questions or comments concerning this report, please contact us.

Sincerely,

GSE Engineering & Consulting, Inc.



Kevin P. Fisher, E.I.
Staff Engineer



This item has been digitally signed and sealed by

on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Jason E. Gowland, P.E.
Principal Engineer
Florida Registration No. 66467

KPF / JEG: tlf
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1. Project Site Location Map

2A. Partial Site Plan Showing Approximate Locations of Field Tests

2B. Partial Site Plan Showing Approximate Locations of Field Tests

1.0 INTRODUCTION

1.1 General

GSE Engineering & Consulting, Inc. (GSE) has completed this geotechnical exploration for the proposed South 301 W Water and Wastewater Pipeline project located in Zephyrhills, Pasco County, Florida. This exploration was performed in accordance with GSE Proposal No. 2023-438 dated July 11, 2023. You authorized our services on July 26, 2023.

1.2 Project Description

This project will consist of a new force main and water main on Gall Boulevard and Tucker Road. You provided information about the project including site plans illustrating the proposed force main alignment and requested soil boring locations.

A proposed 6-inch diameter force main will be installed using horizontal direction drill (HDD) methods. The force main will be located in the western road right-of-way of Gall Boulevard and southern right-of-way of Tucker Road. The 12-inch water main will be constructed in an open trench. The water main will be located in the east Gall Boulevard right-of-way and the northern Tucker Road right-of-way.

A recent aerial photograph of the site was obtained. The site plan and aerial photograph were used in preparation of this exploration and report.

1.3 Purpose

The purpose of this geotechnical exploration was to determine the general subsurface conditions, evaluate these conditions with respect to the proposed construction, and prepare geotechnical parameters and recommendations to assist with the force main and water main designs.

2.0 FIELD AND LABORATORY TESTS

2.1 General Description

The procedures used for field sampling and testing are in general accordance with industry standards of care and established geotechnical engineering practices for this geographic region. This exploration consisted of performing nineteen (19) Standard Penetration Test (SPT) borings to depths of 10 to 20 feet below land surface (bls) along the force main and water main alignments.

The soil borings were performed at the approximate locations as shown on Figures 2A & 2B. The borings were located at the site using the provided site plan and obvious site features as reference. The boring locations should be considered approximate. The soil borings were performed from August 21 through 24, 2023.

2.2 Standard Penetration Test Borings

The soil borings were performed with a drill rig employing flight auger drilling techniques and Standard Penetration Testing (SPT) in accordance with ASTM D1586. The SPTs were performed continuously to 10 feet and at 5-foot intervals thereafter. Soil samples were obtained at the depths where the SPTs were performed. The soil samples were classified in the field, placed in sealed containers, and returned to our laboratory for further evaluation.

After drilling to the sampling depth, the standard two-inch O.D. split-barrel sampler was seated by driving it 6 inches into the undisturbed soil. Then the sampler was driven an additional 12 inches by blows of a 140-pound hammer falling 30 inches. The number of blows required to produce the next 12 inches of penetration were recorded as the penetration resistance (N-value). These values and the complete SPT boring logs are provided in Section 5.1.

Upon completion of the sampling, the boreholes were abandoned in accordance with Water Management District guidelines.

2.3 Soil Laboratory Tests

The soil samples recovered from the soil borings were returned to our laboratory, and examined to confirm the field descriptions. Representative samples were then selected for laboratory testing. The laboratory tests consisted of six (6) percent soil fines passing the No. 200 sieve determinations, six (6) natural moisture content determinations, and two (2) corrosion series tests. These tests were performed in order to aid in classifying the soils and to further evaluate their engineering properties. The laboratory tests are provided in Section 5.2.

3.0 FINDINGS

3.1 Surface Conditions

Mr. Kevin P. Fisher, E.I. with GSE visited the site on August 2, 2023 to observe the site conditions and mark the boring locations. Mr. Fisher returned to the site on August 17, 2023 to re-mark several boring locations where the stakes went missing.

The force main will be located in the western road right-of-way of Gall Boulevard and southern right-of-way of Tucker Road. The water main will be located in the east Gall Boulevard right-of-way and the northern Tucker Road right-of-way.

The topography at the site is moderately sloping up towards the north from the south. Regional topography is rolling hills. The provided site plans indicate the ground surface elevations across the site are near elevations 77.5 to 85.5 feet[1].

3.2 Subsurface Conditions

The locations of the SPT borings are provided on Figures 2A & 2B. Complete logs for the borings are provided in Section 5.1. Descriptions for the soils encountered are accompanied by the Unified Soil Classification System symbol (SM, SP-SM, etc.) and are based on visual examination of the recovered soil samples and the laboratory tests performed. Stratification boundaries between the soil types should be considered approximate, as the actual transition between soil types may be gradual.

The SPT borings located along the proposed force main indicate the soils across these areas are relatively consistent. The auger borings initially penetrated 6 to 10 feet of a near-surface sandy stratum consisting of poorly graded sand, sand with silt, and silty sand (SP, SP-SM, SM). This was underlain by clayey to very clayey sand (SC, SC/CL) and clay-rich soils consisting of sandy clay and clay (CL/CH) to the explored depths of 10 to 20 feet bls in SPT borings A-9, A-11, A-13, A-15, A-16, A-17, A-18, and A-19.

The SPT borings located along the proposed water main indicate the soils across these areas are relatively consistent. The auger borings initially penetrated 8 to 10 feet of a near-surface sandy stratum consisting of poorly graded sand, sand with silt, and silty sand (SP, SP-SM, SM). This was underlain by clay-rich soils consisting of sandy clay and clay (CL/CH) to the explored depths of 10 feet bls in SPT borings A-12 and A-14.

The poorly graded sand, sand with silt, and silty sand (SP, SP-SM, SM) is generally in a very loose to medium dense condition with N-values ranging from 4 to 12 blows per foot. The underlying clayey to very clayey sand (SC, SC/CL) is generally in a loose condition with N-values ranging from 7 to 10 blows per foot. The underlying clay-rich soils (CL/CH) are generally in a firm to stiff condition with N-values ranging from 7 to 14 blows per foot.

The groundwater table was encountered in the SPT borings A-10, A-11 A-12, A-15, A-16, and A-18 at a depth of 8 feet bls at the time of our investigation.

[1] South 301 W – Water and Wastewater Pipelines, Forcemain Plans, Jones Edmunds Project No. 26110-051-01, June 2023

3.3 Review of Published Data

The majority of the site is mapped as three soil series by the Soil Conservation Service (SCS) Soil Survey for Pasco County[2]. The following soil descriptions are from the Soil Survey.

Tavares sand, 0 to 5 percent slopes - This nearly level to gently sloping, moderately well drained soil is on low ridges and knolls throughout the county. Areas are irregular in shape.

The soil is sand to a depth of 80 inches or more.

Typically, the surface later is very dark gray sand about 3 inches thick. Below this, layers of yellowish brown and light yellowish-brown sand extend to a depth of 56 inches. Below this is a layer of very pale brown sand 20 inches thick, and below this, white sand extends to a depth of 80 inches or more.

Included with this soil in mapping are small areas of Adamsville, Astatula, and Candler soils. Also included are small areas of Millhopper and Sparr soils and, along rivers, a few areas of soils that occasionally are flooded. The included soils make up about 10 percent of the map unit.

In most years, under natural conditions, the water table is at a depth of 40 to 60 inches for 6 to 12 months and below 60 inches during very dry periods. The available water capacity is very low. Permeability is very rapid. Natural fertility is low.

Tavares-Urban land complex, 0 to 5 percent slopes - This map unit consists of areas of Urban land and nearly level to gently sloping, moderately well drained Tavares soils on low ridges. Tavares soils make up 45 to 65 percent of the map unit, and Urban land makes up from 30 to 45 percent. The areas of Tavares soils and Urban land are so intricately mixed, or so small, that it is not practical to separate them in mapping at the scale used.

Tavares soils are sand to a depth of 80 inches or more. Typically, the surface layer is very dark gray and is about 3 inches thick. Beneath the surface layer the sand is yellowish brown and light yellowish brown to a depth of 56 inches, very pale brown to between depths of 56 and 76 inches, and white between depths of 76 and 80 inches or more. In some places, the soil has been radically altered. Some of the low areas have been filled or leveled during construction, and other small areas have been cut, built up, or smoothed.

Urban land is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification is not feasible.

Included in mapping, and making up 5 to 15 percent of the unit, are small areas of Adamsville and Astatula soils. The somewhat poorly drained Adamsville soils are in the slightly lower and wetter areas. The excessively drained Astatula soils are in higher, convex areas of the landscape.

Most areas of this map unit are artificially drained by sewer systems, surface ditches, and canals. Tavares soils that are not drained have a water table at a depth of 40 to 60 inches for 6 to 10 months in most years. Permeability is very rapid throughout the Tavares soils, and natural fertility is low. The available water capacity is very low. Reaction ranges from strongly acid to medium acid throughout the soil.

[2] Soil Survey of Pasco County, Florida. Soil Conservation Service, U.S. Department of Agriculture.

Millhopper fine sand, 0 to 5 percent slopes - This nearly level to gently sloping, moderately well drained soil is on uplands. Individual areas are irregular in shape. Slopes are smooth to concave.

Typically, the surface layer is fine sand 7 inches thick. It is dark gray in the upper 3 inches and grayish brown below. The subsurface layer is fine sand and extends to a depth of about 59 inches. It is very pale brown to a depth of 42 inches and then changes to light yellowish brown. Below this, and extending to a depth of 80 inches or more, is the subsoil. It is yellowish brown fine sandy loam in the upper 5 inches and gray sandy clay loam below.

Included with this soil in mapping are similar soils on similar landscape positions. They differ slightly by containing more very fine sand in the surface and subsurface layers. Small areas of these soils are in several parts of the county, but are concentrated in the north-central part. Also included in mapping are small areas of Arredondo, Candler, Kendrick, Nobleton, Sparr, and Tavares soils. The included soils make up about 15 percent of the map unit.

In an unaltered state, this soil has a water table perched above the loamy horizon. The water is at a depth of 40 to 60 inches for 1 to 4 months and at a depth of 60 to 72 inches for 2 to 4 months in most years. In very wet years, the water table may be at a depth of 30 to 40 inches for a cumulative period of 1 to 3 weeks. The available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil.

3.4 Laboratory Soil Analysis

Selected soil samples recovered from the soil borings were analyzed for the percent soil fines passing the No. 200 sieve, natural moisture content, and corrosion series. Samples selected for laboratory testing were collected at depths ranging from 0 to 10 feet bls. These tests were performed to confirm visual soil classification and evaluate their engineering properties. The complete laboratory report is provided in Section 5.2.

The laboratory tests indicate the tested soils consist of sand with silt, silty sand, and very clayey sand. The tested sand with silt (SP-SM) contains approximately 6.4 to 10 percent soil fines passing the No. 200 sieve with natural moisture contents of about 4.8 to 7.1 percent. The tested silty sand (SM) contains approximately 14 to 19 percent soil fines passing the No. 200 sieve with natural moisture contents of about 6.3 to 8.5 percent. The tested very clayey sand (SC/CL) contains approximately 30 percent soil fines passing the No. 200 sieve with a natural moisture content of about 16 percent.

Two (2) soil samples were collected and analyzed for corrosion series testing. One soil sample was collected from SPT boring A-15 from 2 to 6 feet bls, while the other was collected from SPT boring A-16 from 2 to 6 feet bls. The soil sample from A-15 had a resistivity of 13,000 (ohm-cm) and the soil sample from A-16 had a resistivity of 15,000 (ohm-cm). The chloride contents of the tested samples were below detectable limits (BDL) for the soil samples from A-15 and A-16. The sulfate contents of the tested sampled were BDL for the soil samples from A-15 and A-16. The pH's of the tested samples were 8.35 and 8.26 for A-15 and A-16, respectively. The soils at the site are considered slightly aggressive for steel and concrete[3].

[3] Structures Design Guidelines, FDOT Structures Manual, Volume 1, January 2018, Table 1.3.2-1, p. 1-6.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General

The following recommendations are made based upon our understanding of the proposed construction, a review of the attached soil borings and laboratory test data, and experience with similar projects and subsurface conditions. If plans or the location of proposed construction changes from those discussed previously, GSE requests the opportunity to review and possibly amend our recommendations with respect to those changes.

The performance of site improvements may be sensitive to their post-construction relationship to site groundwater levels, seepage zones, or soil/rock characteristics exposed at final site grades. GSE recommends that use of boring information for final design of all site improvements be predicated on proper horizontal and vertical control of borings.

In this section of the report, we present our geotechnical parameters and recommendations to assist with the force main and water main designs as well as our general site preparation guidelines.

4.2 Groundwater

The groundwater table was encountered in SPT borings A-10, A-11, A-12, A-15, A-16, and A-18 at a depth of 8 feet bls at the time of our exploration. However, you should expect water to be at a depth of 1.5 to 3.5 feet bls after periods of heavy and seasonal rainfall.

4.3 Trench Excavation

Based on the information provided, we understand that the force main and water main will be constructed using trench and trenchless methods. The following subsections provide information for the design and construction of the force main and water main and excavations required for the proposed installation.

4.3.1 General

It is likely that auger pits will be required at certain locations to install the force main and water main. For design, the groundwater level should be assumed to exist at the seasonal high groundwater level since these conditions may exist after a heavy rain event. Geotechnical parameters were developed for the design of pit construction as part of the proposed force main and water main.

4.3.2 Geotechnical Parameters

Based on the soil conditions encountered by the borings, geotechnical design parameters were developed for the soils encountered across the site for the design of pit construction or horizontal directional drilling. These design parameters are provided in Table 1 below.

Table 1: Geotechnical Design Soil Parameters						
Boring No.	Range of Depths (ft bls)	Internal Friction Angle ϕ (degrees)	Moist Unit Weight γ (pcf)	Submerged Unit Weight γ (pcf)	Unconfined Compression q_u (ksf)	Cohesion c_u (ksf)
A-1	0 - 4	-	-	-	-	-
	4 - 10	29	95	33	-	-
A-2	0 - 10	30	103	41	-	-
A-3	0 - 10	30	98	36	-	-
A-4	0 - 6	30	98	36	-	-
	6 - 10	30	100	38	-	-
A-5	0 - 10	29	95	33	-	-
A-6	0 - 10	30	100	38	-	-
A-7	0 - 10	30	98	36	-	-
A-8	0 - 10	30	100	38	-	-
A-9	0 - 6	30	107	45	-	-
	6 - 10	-	118	62	4	2
A-10	0 - 10	30	108	46	-	-
A-11	0 - 6	30	103	41	-	-
	6 - 10	-	126	68	3	1.5
A-12	0 - 8	30	109	47	-	-
	8 - 10	-	126	69	4	2
A-13	0 - 8	30	100	38	-	-
	8 - 10	-	126	69	3	1.5
A-14	0 - 8	30	100	38	-	-
	8 - 10	-	126	69	3	1.5
A-15	0 - 8	29	96	34	-	-
	8 - 12	23	103	41	-	-
	12 - 20	-	126	68	4	2
A-16	0 - 8	30	107	45	-	-
	8 - 12	22	107	45	-	-
	12 - 20	-	126	69	4	2
A-17	0 - 8	30	105	43	-	-
	8 - 10	-	126	67	3	1.5
A-18	0 - 8	30	103	41	-	-
	8 - 10	23	115	53	-	-
A-19	0 - 8	30	103	41	-	-
	8 - 10	-	126	67	3	1.5

4.3.3 Excavation Stability

The open excavations may be shored or laid back to a stable slope or supported by some other equivalent means used to provide safety for workers and adjacent structures, if any. The excavations should be made in accordance with OSHA Standards, OSHA 2207, Subpart P, latest revision.

- Excavations less than 5 feet below land surface (bls) – Excavations that are less than 5 feet in depth should be effectively protected when an indication of ground movement is anticipated.
- Excavations greater than 5 feet bls – Excavations that are deeper than 5 feet should be sloped, shored, sheeted, braced, or laid back to a stable slope or supported by some other equivalent means or protection such that workers are not exposed to moving ground or cave-ins. The slopes and shoring should be in accordance with trench safety requirements as per OSHA Standards. For shoring greater than 20 feet (if needed), an engineering evaluation is required.

The excavation pits should be backfilled in accordance with the project specifications. It is likely the excavated material may be used as backfill material provided it meets the requirements of Section 4.7. Fill Suitability of this report. We recommend that the backfill be placed in maximum 12-inch loose lifts that are compacted to at least 95 percent of the Modified Proctor maximum dry density.

4.4 Trenchless Installation

We understand that portions of the proposed main lines will be installed using trenchless methods. Based on the soil conditions encountered, we recommend the geotechnical design parameters provided in Table 1 be used. GSE recommends that appropriate earth pressures be determined for the auger casing.

Carrier pipe must be sufficiently strong to withstand anticipated long-term ground loads and must not be subject to deterioration by substance either in the ground or in the casing. The carrier pipe design should include consideration of not only the loads applied to the pipe, but also factors other than soil loading. These factors could include minimum structural code requirements, loading from pipe jacking operations, and other construction loads. The geotechnical design parameters given in Table 1 should be used in analyzing the soil structure interaction of the carrier pipe.

4.5 Site Preparation

The soils at this site should be suitable for supporting the proposed construction using normal, good practice site preparation procedures. The following recommendations are our general guidelines for site preparation.

4.5.1 Stripping

If required, strip the construction limits and 10 feet beyond the perimeter of all grass, roots, topsoil, and other deleterious materials. You should expect to strip to depths of 12 or more inches. Deeper stripping may be necessary if major root systems are present at the site.

4.5.2 Dewatering

Temporary dewatering may be necessary for this project. If needed, we anticipate dewatering can be accomplished with sumps placed near the construction area, or with underdrains connected to a vacuum pump.

In any case, the site should always be graded to promote runoff and limit the amount of ponding. Localized ponding of stormwater is expected without proper grading during construction, and could render previously acceptable surfaces unacceptable.

4.5.3 Proof-Rolling

Although not anticipated, if required for slabs on grade or above ground improvements, proof-roll the subgrade with heavy rubber-tired equipment, such as a loaded front-end loader or dump truck, to identify any loose or soft zones not found by the soil borings. The proof-rolling should be monitored by a geotechnical engineer or qualified technician. Undercut or otherwise treat these zones as recommended by the geotechnical engineer in this report.

4.5.4 Fill Placement

Imported fill placed to raise the site grades or backfill for trenches should consist of clean sand having less than 10 percent passing the No. 200 sieve. On-site soils meeting the requirements of Section 4.7 may also be used as structural fill. The fill should be placed in maximum 12-inch loose lifts that are compacted to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557). If lighter “walk-behind” compaction equipment is used, this may require lifts of 4 inches or less to achieve the required degree of compaction.

4.6 Quality Control and Construction Materials Testing

It should be noted that the geotechnical engineering design does not end with the advertisement of the construction documents. As the geotechnical engineer of record, GSE is the most qualified to perform the construction materials testing that will be required for this project. The benefits of having the geotechnical engineer of record also perform the construction materials testing are numerous. If GSE continues to be involved with the project through construction, we will be able to constantly re-evaluate and possibly alter our geotechnical recommendations in a timely and cost-effective manner once final design and construction techniques are developed. This often results in cost savings for the project.

4.7 Fill Suitability

The soils encountered at this site within the explored depths range from sands (SP) to clays (CL/CH). A discussion of the suitability for reuse as structural fill for each soil classification according to the Unified Soil Classification System (USCS) designation is provided below.

SP, SP-SM – Sands (SP) and sand with silt (SP-SM) have less than 5 percent and 12 percent soil fines passing the No. 200 sieve, respectively, and are typically well draining soils that are suitable for reuse as structural fill. The sands with silt may require moisture conditioning (drying) to make the material more workable. These soils will require stockpiling and drying before they are reused if they are excavated from below the water table.

SM – Silty sands (SM) can have between 12 percent and 50 percent soil fines passing the No. 200 sieve. Silty sands are typically non-plastic or have low plasticity, and can be reused as structural fill with precautions. Silty sands can be moisture sensitive and difficult to work and compact and can rut if the moisture content is near or above the optimum moisture content. We recommend these soils be moisture conditioned (dried) so that the moisture content during use is at or below the optimum moisture content. Aerating and exposure to the sun is typically the most effective methods of drying these soils. It may not be practical to reuse these materials during the wet season, as frequent rain showers may not allow these soils to dry to a workable moisture content. Suitable silty sands are limited to soil having less than 30 percent soil fines passing the No. 200 sieve. Silty sands with more than 30 percent soil fines are especially moisture sensitive, and are not recommended for reuse as structural fill. These soils will behave more as sandy silt, and for this reason, very silty sands having more than 30 percent soil fines passing the No. 200 sieve have been assigned a dual classification of SM/ML. Silty sand soils that are excavated from below the water table are not recommended for reuse as structural fill due to the amount of time that will be required to dry these soils to a workable condition.

SC – Clayey sand (SC) soils can have between 12 percent and 50 percent soil fines passing the No. 200 sieve. Clayey sands can have a high range of plasticity, varying from a PI of 7 or greater and plotting above the A-line to highly plastic. Friable clayey sands are typically suitable for use as structural fill with precautions. Clayey sands will be moisture sensitive and difficult to work and compact and can rut during placement if the moisture content is near or above the natural moisture content. We recommend these soils be moisture conditioned (dried) so that the moisture content during use is at or below the optimum moisture content. Aerating and exposure to the sun is typically the most effective methods of drying these soils. It may not be practical to reuse these materials during the wet season, as frequent rain showers may not allow these soils to dry to a workable moisture content. Suitable clayey sands are limited to soil having less than 30 percent soil fines passing the No. 200 sieve. Clayey sands with more than 30 percent soil fines passing the No. 200 sieve are especially moisture sensitive and are typically highly plastic, and are not recommended for reuse as structural fill. These soils will behave more as sandy clay, and for this reason, very clayey sands having more than 30 percent soil fines passing the No. 200 sieve have been assigned a dual classification of SC/CH or SC/CL. Clayey sand soils that are excavated from below the water table are not recommended for reuse as structural fill due to the amount of time that will be required to dry these soils to a workable condition.

ML, MH, CL, CH – Silts and clays are not suitable materials for reuse as structural fill.

When using on-site soils as fill materials, we recommend the silty and clayey sand soils (SM, SC) be used in the lower depths of the fill. Sand and sand with silt (SP, SP-SM) should be used in the upper portions of the fill. We recommend a minimum of 2 feet of sand (SP, SP-SM) cover the silty and clayey sand fill materials to reduce the potential for soggy surface conditions due to the low permeability characteristics of the silty and clayey sand materials.

5.0 FIELD DATA

5.1 Standard Penetration Test Soil Boring Logs

GSE Engineering & Consulting, Inc.
5590 SW 64th Street, Suite B
Gainesville, Florida 32608
Telephone: (352) 377-3233
Fax: (352) 377-0335

BORING NUMBER A-1

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SM) Brown silty SAND		AU 1					14	6.3	
			4	AU 2							
5		(SP) Loose brown SAND		SPT 3	2-3-2-2 (5)						
			8	SPT 4	3-3-4-3 (7)						
10		(SP-SM) Very loose brown SAND with silt	10	SPT 5	3-2-2-4 (4)						
		Bottom of borehole at 10.0 feet.									

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Gainesville, Florida 32608
Telephone: (352) 377-3233
Fax: (352) 377-0335

BORING NUMBER A-2

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Dark brown SAND with silt	2	AU 1							20 40 60 80
		(SP-SM) Loose brown SAND with silt		AU 2							
5			6	SPT 3	2-3-4-4 (7)						
		(SP) Loose pale brown SAND		SPT 4	3-4-4-3 (8)						
10			10	SPT 5	2-3-3-4 (6)						
		Bottom of borehole at 10.0 feet.									

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Gainesville, Florida 32608
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Fax: (352) 377-0335

BORING NUMBER A-3

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0		(SP-SM) Very loose dark brown SAND with silt		AU 1							
				AU 2							
5				SPT 3	3-2-2-3 (4)						
		(SP) Loose pale brown SAND	6	SPT 4	3-4-3-3 (7)						
10			10	SPT 5	4-4-3-4 (7)						
		Bottom of borehole at 10.0 feet.									

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Fax: (352) 377-0335

BORING NUMBER A-4

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SM) Loose dark brown silty SAND		AU 1							
				AU 2					19	8.5	
5			6	SPT 3	2-3-3-4 (6)						
		(SP) Loose pale brown SAND		SPT 4	3-4-4-3 (8)						
10			10	SPT 5	3-2-3-4 (5)						
		Bottom of borehole at 10.0 feet.									

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Fax: (352) 377-0335

BORING NUMBER A-5

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Gray SAND with silt		AU 1							20 40 60 80
				AU 2							
			4								
5		(SP) Very loose to loose brown SAND		SPT 3	3-2-3-3 (5)						
				SPT 4	3-2-2-4 (4)						
10				SPT 5	3-4-3-3 (7)						
			10								
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-6

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0		(SP-SM) Loose brown SAND with silt		AU 1							
				AU 2							
5				SPT 3	3-3-2-2 (5)						
		(SP) Loose pale brown SAND	6	SPT 4	3-4-4-3 (8)						
10			10	SPT 5	3-3-3-4 (6)						
		Bottom of borehole at 10.0 feet.									

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Fax: (352) 377-0335

BORING NUMBER A-7

CLIENT Jones Edmunds & Associates, Inc. **PROJECT NAME** South 301 W Water and Wastewater Pipelines

PROJECT NUMBER 16198 **PROJECT LOCATION** Zephyrhills, Pasco County, Florida

DATE STARTED _____ **COMPLETED** _____ **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR Watson's Drilling, LLC **GROUND WATER LEVELS:**

DRILLING METHOD Flight Auger ▼ **AT TIME OF DRILLING** NE

LOGGED BY LBW **CHECKED BY** KPF ▽ **ESTIMATED SEASONAL HIGH** 1.5 ft

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt ▽	2	AU 1							20 40 60 80
		(SP) Loose tan SAND		AU 2							
5				SPT 3	2-2-3-2 (5)						▲
				SPT 4	2-2-3-2 (5)						▲
10			10	SPT 5	3-4-4-3 (8)						▲
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-8

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt		AU 1							20 40 60 80
				AU 2							
			4								
5		(SP) Very loose to loose pale brown SAND		SPT 3	3-2-2-4 (4)						
				SPT 4	3-4-4-3 (8)						
10				SPT 5	3-4-3-3 (7)						
			10								
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-9

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Dark brown SAND with silt		AU 1							20 40 60 80
			4	AU 2							
5		(SP) Loose pale brown SAND		SPT 3	3-4-4-3 (8)						
			6								
		(CL/CH) Firm to stiff orange and gray CLAY		SPT 4	4-3-4-5 (7)						
10				SPT 5	4-6-6-7 (12)						
			10								
		Bottom of borehole at 10.0 feet.									

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Fax: (352) 377-0335

BORING NUMBER A-10

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** 8.0 ft
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt	2	AU 1							20 40 60 80
		(SP) Loose to medium dense pale brown SAND		AU 2							
5				SPT 3	3-4-3-3 (7)						
				SPT 4	2-3-3-4 (6)						
10			10	SPT 5	3-4-8-3 (12)						
		Bottom of borehole at 10.0 feet.									

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Gainesville, Florida 32608
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Fax: (352) 377-0335

BORING NUMBER A-11

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** 8.0 ft
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt		AU 1							20 40 60 80
			4	AU 2							
5		(SP) Loose pale brown SAND		SPT 3	3-4-3-3 (7)						
			6								
		(CL/CH) Stiff orange and gray sandy CLAY		SPT 4	4-5-8-4 (13)						
10			10	SPT 5	5-4-6-6 (10)						
		Bottom of borehole at 10.0 feet.									

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Gainesville, Florida 32608
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Fax: (352) 377-0335

BORING NUMBER A-12

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING 8.0 ft
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt	2	AU 1							
		(SP-SM) Loose pale brown SAND with silt		AU 2							
5				SPT 3	3-4-4-3 (8)				6.4	5.0	
			8	SPT 4	5-4-5-5 (9)						
10		(CL/CH) Stiff gray and orange CLAY	10	SPT 5	4-5-7-7 (12)						
		Bottom of borehole at 10.0 feet.									

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5590 SW 64th Street, Suite B
Gainesville, Florida 32608
Telephone: (352) 377-3233
Fax: (352) 377-0335

BORING NUMBER A-13

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** NE
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP) Brownish orange SAND	2	AU 1							20 40 60 80
		(SP-SM) Gray SAND with silt ▽	4	AU 2							
5		(SP) Loose pale brown SAND		SPT 3	3-3-2-3 (5)						
			8	SPT 4	3-4-4-3 (8)						
10		(CL/CH) Stiff brown sandy CLAY	10	SPT 5	5-6-6-7 (12)						
		Bottom of borehole at 10.0 feet.									

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Fax: (352) 377-0335

BORING NUMBER A-14

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0		(SP-SM) Gray SAND with silt	2	AU 1							
		(SP) Loose pale brown SAND		AU 2							
5				SPT 3	2-3-2-4 (5)						
			8	SPT 4	3-4-4-3 (8)						
		(CL/CH) Stiff brown sandy CLAY		SPT 5	5-5-7-7 (12)						
10			10								
		Bottom of borehole at 10.0 feet.									

SPT BORINGS - GINT STD US.GDT - 9/6/23 15:32 - C:\USERS\JGALLER\DESKTOP\16198 BORINGS.GPJ

GSE Engineering & Consulting, Inc.
5590 SW 64th Street, Suite B
Gainesville, Florida 32608
Telephone: (352) 377-3233
Fax: (352) 377-0335

BORING NUMBER A-15

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** 8.0 ft
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Loose brown SAND with silt		AU 1							
		pH = 8.35 *R = 13000* ▽ *Cl = BDL* *S = BDL*		AU 2							
5			6	SPT 3	2-2-3-2 (5)				7.8	4.8	
		(SP) Loose pale brown SAND	8	SPT 4	2-3-3-4 (6)						
		▼ (SC) Loose orange clayey SAND		SPT 5	3-3-4-6 (7)						
10			12								
		(CL/CH) Stiff orange and gray sandy CLAY		SPT 6	4-5-6 (11)						
15			17								
		(CL/CH) Stiff gray CLAY with limestone		SPT 7	5-6-6 (12)						
20			20								
		Bottom of borehole at 20.0 feet.									

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GSE Engineering & Consulting, Inc.
5590 SW 64th Street, Suite B
Gainesville, Florida 32608
Telephone: (352) 377-3233
Fax: (352) 377-0335

BORING NUMBER A-16

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** 8.0 ft
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt	2	AU 1							
		(SP-SM) Loose pale brown SAND with silt *pH = 8.26* *R = 15000* ▽ *Cl = BDL* *S = BDL*		AU 2							
5				SPT 3	3-3-4-3 (7)				10	7.1	
		▼	8	SPT 4	3-2-7-3 (9)						
		(SC/CL) Loose orange very clayey SAND		SPT 5	3-4-4-5 (8)						
10			12								
		(CL/CH) Stiff gray and orange sandy CLAY		SPT 6	4-5-5 (10)						
15			17								
		(CL/CH) Stiff gray CLAY with limestone		SPT 7	6-7-7 (14)						
20			20								
		Bottom of borehole at 20.0 feet.									

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GSE Engineering & Consulting, Inc.
5590 SW 64th Street, Suite B
Gainesville, Florida 32608
Telephone: (352) 377-3233
Fax: (352) 377-0335

BORING NUMBER A-17

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0		(SP-SM) Brown SAND with silt	2	AU 1							
		(SP) Loose pale brown SAND		AU 2							
5				SPT 3	3-3-4-3 (7)						
			8	SPT 4	3-4-4-3 (8)						
10		(CL/CH) Stiff brown sandy CLAY	10	SPT 5	4-6-5-5 (11)						
		Bottom of borehole at 10.0 feet.									

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GSE Engineering & Consulting, Inc.
5590 SW 64th Street, Suite B
Gainesville, Florida 32608
Telephone: (352) 377-3233
Fax: (352) 377-0335

BORING NUMBER A-18

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** 8.0 ft
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt	2	AU 1							20 40 60 80
		(SP) Loose pale brown SAND		AU 2							
5				SPT 3	3-4-3-3 (7)						
			8	SPT 4	4-4-3-4 (7)						
		(SC/CL) Loose brown very clayey SAND	10	SPT 5	4-5-5-6 (10)				30	16	
10		Bottom of borehole at 10.0 feet.									

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GSE Engineering & Consulting, Inc.
5590 SW 64th Street, Suite B
Gainesville, Florida 32608
Telephone: (352) 377-3233
Fax: (352) 377-0335

BORING NUMBER A-19

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt	2	AU 1							20 40 60 80
		(SP) Loose pale brown SAND		AU 2							
5				SPT 3	3-4-3-3 (7)						
			8	SPT 4	3-3-4-4 (7)						
		(CL/CH) Stiff brown sandy CLAY	10	SPT 5	4-6-5-5 (11)						
10		Bottom of borehole at 10.0 feet.									

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5.2 Laboratory Results

GSE Engineering & Consulting, Inc.

SUMMARY REPORT OF LABORATORY TEST RESULTS

Project Number: 16198

Project Name: South 301 W Water and Wastewater Pipelines

Boring Number	Depth (ft)	Soil Description	Natural Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Percent Passing No. 200 Sieve	Organic Content (%)	Hydraulic Conductivity (ft/day)	Unified Soil Classification
A-1	0-2	Brown silty SAND	6.3				14			SM
A-4	2-4	Loose dark brown silty SAND	8.5				19			SM
A-12	4-6	Loose pale brown SAND with silt	5.0				6.4			SP-SM
A-15	2-6	Loose brown SAND with silt	4.8				7.8			SP-SM
A-16	2-6	Loose pale brown SAND with silt	7.1				10			SP-SM
A-18	8-10	Loose brown very clayey SAND	16				30			SC/CL

GSE Engineering & Consulting, Inc.

SUMMARY REPORT OF LABORATORY TEST RESULTS

Project Number: 16198

Project Name: South 301 W Water and Wastewater Pipelines

Boring Number	Depth (ft)	Soil Description	pH	Resistivity (ohm-cm)	Chloride Content (ppm)	Sulfate Content (ppm)
A-15	2-6	Loose brown SAND with silt	8.35	13000	BDL	BDL
A-16	2-6	Loose pale brown SAND with silt	8.26	15000	BDL	BDL

5.3 Key to Soil Classification

KEY TO SOIL CLASSIFICATION CHART

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests				SYMBOLS		GROUP NAME
				GRAPHIC	LETTER	
COARSE-GRAINED SOILS	Gravels	Clean Gravels	Cu ≥ 4 and 1 ≤ Cc ≤ 3		GW	Well graded GRAVEL
More than 50% retained on No. 200 sieve	More than 50% of coarse fraction retained on No. 4 sieve	Less than 5% fines	Cu < 4 and/or 1 > Cc > 3		GP	Poorly graded GRAVEL
		Gravels with fines	Fines classify as ML or MH		GM	Silty GRAVEL
		More than 12% fines	Fines classify as CL or CH		GC	Clayey GRAVEL
	Sands	Clean Sands	Cu ≥ 6 and 1 ≤ Cc ≤ 3		SW	Well graded SAND
	50% or more of coarse fraction passes No. 4 sieve	Less than 5% fines	Cu < 6 and/or 1 > Cc > 3		SP	Poorly graded SAND
		Sand with fines	Fines classify as ML or MH		SP-SM	SAND with silt
		5% ≤ fines < 12%	Fines classify as CL or CH		SP-SC	SAND with clay
		Sand with fines	Fines classify as ML or MH		SM	Silty SAND
		12% ≤ fines < 30%	Fines classify as CL or CH		SC	Clayey SAND
		Sand with fines	Fines classify as ML or MH		SM	Very silty SAND
		30% fines or more	Fines classify as CL or CH		SC	Very clayey SAND
FINE-GRAINED SOILS	Clays	inorganic	50% ≤ fines < 70%		CL/CH	Sandy CLAY
50% or more passes the No. 200 sieve			70% ≤ fines < 85%		CL/CH	CLAY with sand
			fines ≥ 85%		CL/CH	CLAY
	Silts and Clays	inorganic	PI > 7 and plots on/above "A" line		CL	Lean CLAY
	Liquid Limit less than 50		PI < 4 or plots below "A" line		ML	SILT
		organic	Liquid Limit - oven dried / Liquid Limit - not dried < 0.75		OL	Organic clay / Organic silt
	Silts and Clays	inorganic	PI plots on or above "A" line		CH	Fat CLAY
	Liquid Limit 50 or more		PI plots below "A" line		MH	Elastic SILT
		organic	Liquid Limit - oven dried / Liquid Limit - not dried < 0.75		OH	Organic clay / Organic silt
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor				PT	PEAT

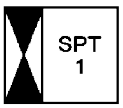
CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

	No. OF BLOWS, N	RELATIVE DENSITY
	0 - 4	Very Loose
	5 - 10	Loose
SANDS:	11 - 30	Medium dense
	31 - 50	Dense
	OVER 50	Very Dense

	No. OF BLOWS, N	RELATIVE DENSITY
	0 - 8	Very Soft
	9 - 18	Soft
LIMESTONE:	19 - 32	Moderately Hard
	33 - 50	Hard
	OVER 50	Very Hard

	No. OF BLOWS, N	CONSISTENCY
	0 - 2	Very Soft
SILTS	3 - 4	Soft
&	5 - 8	Firm
CLAYS:	9 - 15	Stiff
	16 - 30	Very Stiff
	31 - 50	Hard
	OVER 50	Very Hard

SAMPLE GRAPHIC TYPE LEGEND



Location of SPT Sample



Location of Auger Sample

PARTICLE SIZE IDENTIFICATION

BOULDERS:		Greater than 300 mm
COBBLES:		75 mm to 300 mm
GRAVEL:	Coarse -	19.0 mm to 75 mm
	Fine -	4.75 mm to 19.0 mm
SANDS:	Coarse -	2.00 mm to 4.75 mm
	Medium -	0.425 mm to 2.00 mm
	Fine -	0.075 mm to 0.425 mm
SILTS & CLAYS:		Less than 0.075 mm

LABORATORY TEST LEGEND

LL	=	Liquid Limit, %
PL	=	Plastic Limit, %
PI	=	Plasticity Index, %
% PASS - 200	=	Percent Passing the No. 200 Sieve
MC	=	Moisture Content, %
ORG	=	Organic Content, %
k_h	=	Horizontal Hydraulic Conductivity, ft/day

6.0 LIMITATIONS

6.1 Warranty

This report has been prepared for our client for their exclusive use, in accordance with generally accepted soil and foundation engineering practices, and makes no other warranty either expressed or implied as to the professional advice provided in the report.

6.2 SPT Borings

The determination of soil type and conditions was performed from the ground surface to the maximum depth of the borings, only. Any changes in subsurface conditions that occur between or below the borings would not have been detected or reflected in this report.

Soil classifications that were made in the field are based upon identifiable textural changes, color changes, changes in composition or changes in resistance to penetration in the intervals from which the samples were collected. Abrupt changes in soil type, as reflected in boring logs and/or cross sections may not actually occur, but instead, be transitional.

Depth to the water table is based upon observations made during the performance of the SPT borings. This depth is an estimate and does not reflect the annual variations that would be expected in this area due to fluctuations in rainfall and rates of evapotranspiration.

6.3 Site Figures

The measurements used for the preparation of the figures in this report were made using the provided site plans and by estimating distances from existing structures and site features. Figures in this report were not prepared by a licensed land surveyor and should not be interpreted as such.

6.4 Unanticipated Soil Conditions

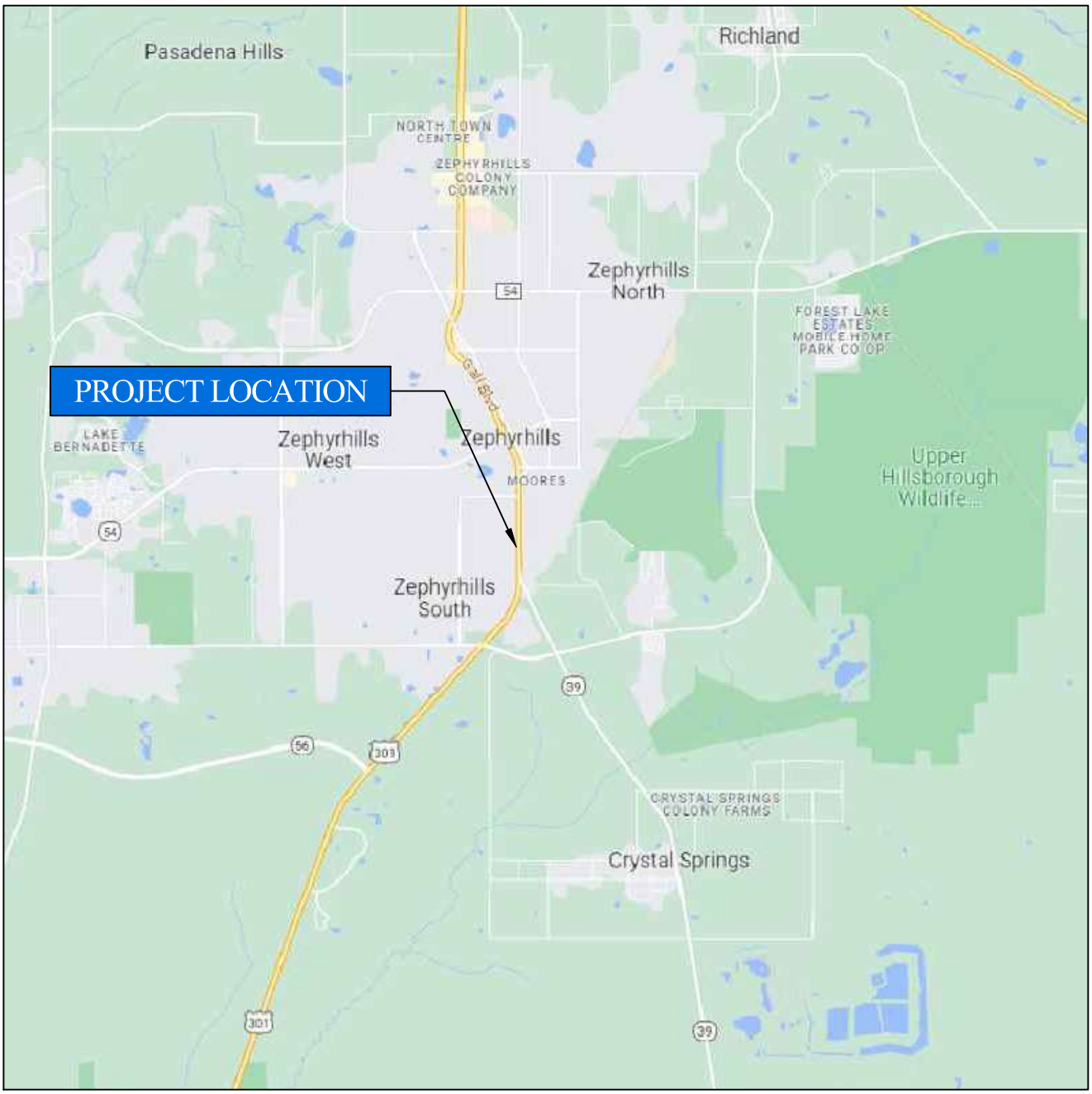
The analysis and recommendations submitted in this report are based upon the data obtained from soil borings performed at the locations indicated on Figures 2A and 2B. This report does not reflect any variations that may occur between these borings.

The nature and extent of variations between borings may not become known until excavation begins. If variations appear, we may have to re-evaluate our recommendations after performing on-site observations and noting the characteristics of any variations.

6.5 Misinterpretation of Soil Engineering Report

GSE Engineering & Consulting, Inc. is responsible for the conclusions and opinions contained within this report based upon the data relating only to the specific project and location discussed herein. If others make the conclusions or recommendations based upon the data presented, those conclusions or recommendations are not the responsibility of GSE.

FIGURES



NORTH

NOT TO SCALE

SOUTH 301 W WATER AND WASTEWATER PIPELINES ZEPHYRHILLS, PASCO COUNTY, FLORIDA GSE PROJECT NO. 16198	PROJECT SITE LOCATION MAP		
	DESIGNED BY: KPF CHECKED BY : JEG DRAWN BY : EEW	GSE Engineering & Consulting, Inc.	FIGURE 1

PARTIAL SITE PLAN SHOWING APPROXIMATE
LOCATIONS OF FIELD TESTS

FIGURE 2A

GSE Engineering & Consulting, Inc.

DESIGNED BY : KPF
CHECKED BY : JEG
DRAWN BY : EEW

SOUTH 301 W WATER AND WASTEWATER PIPELINES
ZEPHYRHILLS, PASCO COUNTY, FLORIDA
GSE PROJECT NO. 16198

C11

C12

C13

C14

C15

LEGEND:

SPT BORING

NORTH

0 100'

SCALE: 1" = 100' APPROX.

PARTIAL SITE PLAN SHOWING APPROXIMATE LOCATIONS OF FIELD TESTS

FIGURE 2B

GSE Engineering & Consulting, Inc.

DESIGNED BY : KPF
CHECKED BY : JEG
DRAWN BY : EEW

SOUTH 301 W WATER AND WASTEWATER PIPELINES
ZEPHYRHILLS, PASCO COUNTY, FLORIDA
GSE PROJECT NO. 16198

APPENDIX B

PERMITS

Pasco County
Florida Department of Transportation (FDOT)
Florida Department of Environmental Protection (FDEP) (Water)
Florida Department of Environmental Protection (FDEP) (Wastewater)

Pasco County Permit

FDOT Permit

FLORIDA DEPARTMENT OF TRANSPORTATION

UTILITY PERMIT

December 14, 2016

PERMIT NO: 2023-H-798-00197

STATE ROAD INFORMATION

County:	Section:	State Road No:	Beginning Mile Post:	Ending Mile Post:
Pasco	14050000	SR 41	3.588	3.588

APPLICANT INFORMATION

The Utility Agency Owner (UAO) shall be identified in this Applicant Information Box. When the UAO is a City or County and desires to have the Utility Builder make a joint permit applicant, as prescribed in Section 2.1(4) of the 2017 Utility Accommodation Manual (UAM), the Utility Builder shall also be identified in this Applicant Information Box. A Utility Builder alone cannot apply for a utility permit without the City or County adding them as a joint applicant.

Utility Agency/Owner (UAO)

Name: City of Zephyrhills Utilities Department
Contact Person: City of Zephyrhills Utilities Department
Address: 5335 8th St
City: Zephyrhills
State: Florida
Zip: 33542
Telephone: 8137800008
Email: jbostic@ci.zephyrhills.fl.us

Utility Builder (only applicable when the UAO is a City or County)

Name:
Contact Person:
Address:
City:
State:
Zip:
Telephone:
Email:

WORK DESCRIPTION

The Applicant(s) requests permission from the Florida Department of Transportation (FDOT) to construct, operate, and maintain the utilities as described below and as depicted in the incorporated documentation.

The project includes the installation of approximately 6,000 LF of 6" PVC sanitary sewer force main and 3,000 LF of 12" PVC potable water main. Project restoration will include; pavement repair, mill and overlay of the roads, re-sodding of affected areas, and replacement of concrete curb/gutter and sidewalk.

Utility Work No:

Additional sheets are attached and are incorporated into this permit Yes ☐ No ☑

For FDEP certification, the FDOT agency report is attached in accordance with UAM Section 2.4.1 (13) Yes ☐ No ☑

TRAFFIC CONTROL (TCP)

☑ The TCP will comply with the following 600 series index(es) 602, 611

☐ A TCP has been attached and incorporated into this permit application in compliance with UAM Section 2.4.2.

MOT Technician's contact information (may be supplied at the two (2) business day notification to FDOT):

Name: _____ Telephone _____ Email: _____

COMMENCEMENT OF WORK

The UAO and/or Utility Builder shall commence actual construction in good faith within sixty (60) calendar days after approval of the permit application. If the beginning date is more than sixty (60) calendar days from the date of approval, the UAO and/or Utility Builder must review the permit with the FDOT Approving Engineer listed to make sure no changes have occurred to the transportation facility that would affect the permit's continued approval. The UAO and/or Utility Builder shall make good faith efforts to expedite the work and complete the work within the calendar days indicated.

Anticipated Start Date: 1/1/2024

Calendar days needed to completed: 365

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

Florida Department of Transportation

UTILITY PERMIT

PERMIT NO: 2023-H-798-00197

APPLICANT SIGNATURE

By the below signature(s) the UAO and/or Utility Builder agree(s) to construct, operate, and maintain the work as noted in the above Work Description, shown in plans and incorporated documents, in compliance with the UAM, all instructions noted in the FDOT Special Instructions Box, and special instructions incorporated into this permit. The UAO and/or Utility Builder declares, the location of all existing utilities that it owns or has an interest in, both aerial and underground, are accurately shown on the plans of the work areas. In accordance with UAM Section 2.8, the UAO and/or Utility Builder further declares that a letter of notification was delivered to the owners of other facilities within the work areas and that those listed below are the only facility owners known to be involved or potentially impacted by the proposed work.

Date Notified:	Name of other facility owners (attach additional sheets if necessary).
6/22/2023	Charter Communications
6/22/2023	City of Zephyrhills
7/3/2023	Duke Energy
6/22/2023	Frontier Communications
6/22/2023	Pasco County Utilities

Utility Agency/Owner	Utility Builder (when applicable)
Signature: JOHN BOSTIC III (digital signature) Date: 9/25/2023	Signature: _____ Date: _____
Name (printed): JOHN BOSTIC III	Name (printed): _____
Title: _____	Title: _____

FDOT PROJECT INFORMATION

Pursuant to UAM Section 2.1(10), the utility work is within FDOT projects listed below and must have a Utility Work Schedule for each project approved prior to commencement of work within the FDOT project limits:

FDOT construction is proposed or underway. Refer to Financial Project Id: FDOT project # 440063-1
Please find attached the Utility Permit on the above referenced project from the City of Zephyrhills.
The scope of work under this permit is for adjustment of existing facilities along the US 301/SR

FDOT SPECIAL INSTRUCTIONS

In accordance with UAM Section 2.7, FDOT incorporates the below and attached special instructions into this permit.

Contact FDOT James Meyer 48 hours before working in FDOT R/W 352-848-2610, to activate permit.

Provide MOT Technician “Name, Phone Number, Email Address”.

Ensure time line provided is followed for the Tucker Road and US 301 work near the south end of this project, So no conflict with FDOT project occurs.

Additional FDOT Special Instructions are attached and incorporated into this permit. Yes ☑ No ☐

PERMIT APPROVAL

By signature below, FDOT gives permission to the UAO and /or Utility Builder to construct, operate, and maintain the utilities indicated in this Utility Permit in compliance with the UAM, all incorporated documents, and special instructions. Any changes to the approved work must be approved by the FDOT’s Approving Engineer and attached and incorporated into this permit in accordance with UAM Section 2.11.

Approving Engineer: James A. Meyer (digital signature) Date: 11/6/2023
Name: James A. Meyer
Title: MAINTENANCE MANAGER/PERMITS

Notification of Utility Work to be provided to: Telephone (352) 848-2600 ext. 2610 or Email: james.meyer@dot.state.fl.us

An FDOT Representative is required to be present on the worksite prior to commencement of work. Yes ☑ No ☐

Rep. Name: David Skrelunas Telephone 3528482606 Email: david.skrelunas@dot.state.fl.us

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

Florida Department of Transportation

UTILITY PERMIT

PERMIT NO: 2023-H-798-00197

CERTIFICATION

I, the undersigned UAO and/or Utility Builder, hereby CERTIFY that the utilities were constructed and inspected in compliance with the UAM all incorporated documents, and special instructions. Pursuant to UAM Section 2.11, all changes have been approved by the FDOT's Approving Engineer and incorporated into this permit along with all other material certifications, test results, bore logs, approved plans changes, as-built plans or other required documentation.

I also CERTIFY that work began on _____ and was completed on _____ and that the area was left in as good or better condition than when the work began.

Utility Agency/Owner	Utility Builder (when applicable)
Signature: _____ Date _____	Signature:_____ Date _____
Name (printed): _____	Name (printed): _____
Title: _____	Title: _____

FINAL INSPECTION OF WORK

☐ The work was inspected and found to be in non-compliance as noted below:

☐ All issues of non-compliance listed above have been brought into compliance and/or FDOT has no outstanding issues that need to be addressed by the UAO and/or Utility Builder. However, this final inspection does not release the UAO and/or Utility Builder of their continuing responsibilities pursuant to Rule 14-46.001, the UAM, all incorporated documents, and special instructions.

FDOT Inspector: _____ Date: _____

Name: _____

Title: _____

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

PERMIT NO.: 2023-H-798-00197

STATE ROAD INFORMATION:
Pasco SR 41, Section: 14050000, Begin MP: 3.588, End MP: 3.588, Pasco SR 39, Section: 14110000, Begin MP: 3.448, End MP: 3.448

NAME OF OTHER FACILITY OWNERS / DATE NOTIFIED:
Facility Name: Teco, Date Notified: 6/22/2023, Facility Name: Southfork M/ H Community, Date Notified: 6/22/2023, Facility Name: Uniti FIber, Date Notified: 6/23/2023, Facility Name: Blue Triton Brands, Date Notified: 6/26/2023

FDOT PROJECT INFORMATION:
FDOT construction is proposed or underway. Refer to Financial Project Id: FDOT project # 440063-1
Please find attached the Utility Permit on the above referenced project from the City of Zephyrhills. The scope of work under this permit is for adjustment of existing facilities along the US 301/SR 41 corridor to accommodate the proposed FDOT improvements. The installation has been reviewed with the Construction Resident Office and special requirements are listed below.
• City of Zephyrhills representatives will need to contact Joe Goddard (727-543-3614) 7 days prior to beginning utility installations.
The Zephyrhills pipeline project is on a 15-month construction schedule as follows:

• First week of January 2024: begin shop drawing review and material procurement. (3 months)
• March 2024: begin construction at the northernmost end of the construction corridor. (12 months)

With the Tucker-road crossing at the southernmost end of the project, it is anticipated this section of the project would not be impacted until the fall of 2024.

THE WORK WAS INSPECTED AND FOUND TO BE IN NON-COMPLIANCE AS NOTED BELOW:

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

PERMIT NO.: 2023-H-798-00197

The complete special instructions could not fit in the space allotted on Page 2 of the Utility Permit so they are displayed below.

Special FDOT Instructions

Contact FDOT James Meyer 48 hours before working in FDOT R/W 352-848-2610, to activate permit.

Provide MOT Technician “Name, Phone Number, Email Address”.

Ensure time line provided is followed for the Tucker Road and US 301 work near the south end of this project, So no conflict with FDOT project occurs.

Sidewalks shall NOT be closed more than 2 weeks the duration of the permit. The contractor will need to provide accommodation for pedestrians.
Any damaged sidewalk shall be repaired per SP# 522-001 & 522-002.

Any damage to FDOT Rdwy. shall be repaired 50' in each direction entire width of the land. Match existing

Restore FDOT R/W with sod only.

Contact Scott Brown Pasco County for locates of lighting fiber and signal conduits Pasco County
727-849-6845

Enter in the FDOT’s One Stop Permitting – “Certify Construction Complete” or provide, original signed copy of Permit Application (pg. 3 of 3) and As-builts. Once construction is completed for permit close out.

FDOT project # 440063-1
Please find attached the Utility Permit on the above referenced project from the City of Zephyrhills. The scope of work under this permit is for adjustment of existing facilities along the US 301/SR 41 corridor to accommodate the proposed FDOT improvements. The installation has been reviewed with the Construction Resident Office and special requirements are listed below.
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With the Tucker-road crossing at the southernmost end of the project, it is anticipated this section of the project would not be impacted until the fall of 2024.
• Please ensure the City of Zephyrhills is clear of drainage structures & drainage pipe throughout the project limits. Along with understanding the size of the structures that will be installed and needing proper shoring and stabilizing methods with the surrounding areas around the structure, and clear of Light Pole and Mast Arms Foundations throughout the project.
• Be aware that the facilities that the City of Zephyrhills is installing are for the UAO’s benefit. They are aware of the upcoming FDOT projects and that any placements within this permit will be relocated at the UAO’s cost in coordination with the proposed upcoming road improvement project 440063-1.
• Please provide certified as-built data on the approved submitted FDOT plan sets of City of Inverness underground installations, within 45 days after completion. (ie. Elevation, offsets, & stationing)
Upon Final execution of this permit, please forward the District Utilities’ copy to the Construction office indicated above with a copy of this memo attached.

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

PATH=Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\051-01 SOUTH 301 W-WW PIPELINES\DESIGN&CONSTRUCTION\CAD\DWGS\GENERAL\2611005101-G01.DWG

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22x34

SOUTH 301 W
WATER AND WASTEWATER PIPELINES

CITY OF ZEPHYRHILLS, FLORIDA

PREPARED FOR:

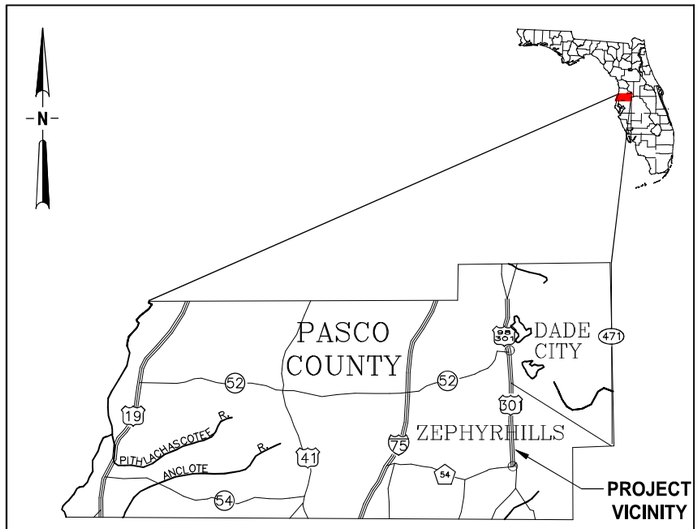
THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH ACIE FRASER, P.E. ON DATE ADJACENT TO SEAL.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED, THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

JONES EDMUNDS
8657 BAYPINE ROAD, SUITE 300
JACKSONVILLE, FL 32256
CERTIFICATE OF AUTHORIZATION #1841
E.O.R.: KENNETH ACIE FRASER, P.E., No. 57452

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING DIVISIONS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.:
GENERAL, CIVIL, EROSION CONTROL

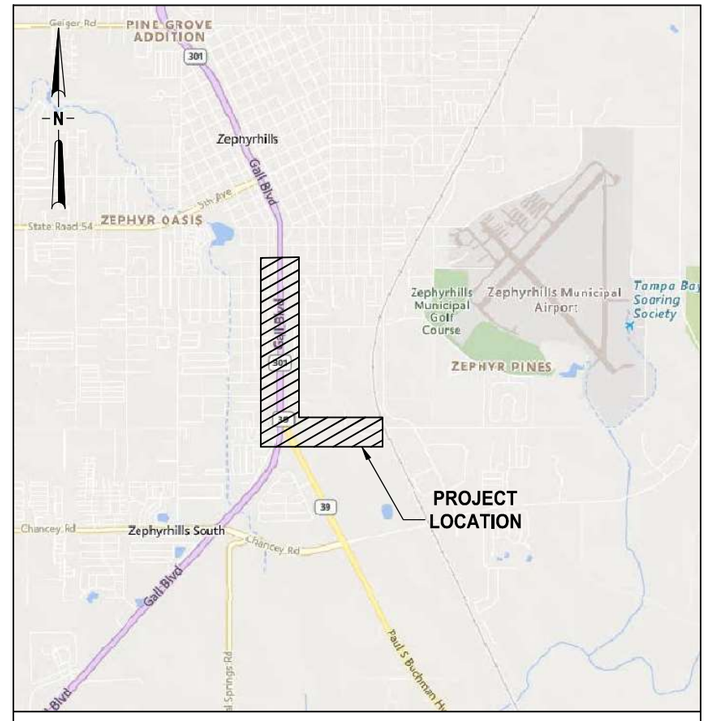
KENNETH ACIE FRASER
LICENSE
No. 57452
STATE OF
FLORIDA
PROFESSIONAL ENGINEER



SITE VICINITY MAP

PREPARED BY:

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
324 S. HYDE PARK AVE., SUITE 250 TAMPA, FLORIDA 33606 / (813) 258-0703



PROJECT LOCATION

PROJECT # 26110-051-01

SEPTEMBER 2023

BID DOCUMENTS

Approved
2023.11.798.00197
James A. Meyer
11/6/2023

LAST SAVED: 9/25/2023 8:31 AM BY:KFRASER PLOTTED:9/25/2023 08:41 AM BY:KENNETH A. FRASER, PE

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GENERAL NOTES

REFERENCED DATA

1. TOPOGRAPHIC SURVEY PERFORMED BY DC JOHNSON AND ASSOCIATES, 11911 SOUTH CURLEY ST. SAN ANTONIO, FL 33576 A LICENSED PROFESSIONAL LAND SURVEYOR, DATED 3/09/2023.

2. THE SURVEY INFORMATION CONTAINED HEREIN WAS OBTAINED FOR DESIGN PURPOSES AND MAY NOT BE AN ADEQUATE REPRESENTATION OF ACTUAL CONDITIONS FOR PROJECT CONSTRUCTION. ANY EXISTING CONTOURS SHOWN REPRESENT INTERPOLATIONS/EXTRAPOLATIONS FROM THE BEST AVAILABLE SURVEY DATA. ALL RISKS RESULTING FROM THE USE OR INTERPRETATION OF THE SURVEY DATA SHOWN SHALL BE BORNE BY THE CONTRACTOR.

GENERAL

3. THE CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS AND REQUIREMENTS OF ALL PERMITS (FDEP, FDOT, PASCO COUNTY BUILDING DEPARTMENT, ETC) OBTAINED FOR THIS PROJECT.

4. THE CONTRACTOR IS ADVISED NOT TO SCALE FROM DRAWINGS BUT TO FIELD VERIFY ALL DIMENSIONS. THE DIMENSIONS OF SPECIFIED AND FURNISHED PRODUCTS AND MATERIALS TAKE PRECEDENCE OVER DIMENSIONS INDICATED ON THE DRAWINGS. IF SIGNIFICANT DEVIATIONS OCCUR, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 72 HOURS PRIOR TO CONSTRUCTION FOR A DETERMINATION AND RESOLUTION.

5. THE CONTRACTOR SHALL VERIFY THAT ALL CLEARANCES CAN BE MET. IF ANY CLEARANCES CANNOT BE MET, THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IN WRITING A MINIMUM OF 15 WORKING DAYS PRIOR TO CONSTRUCTING AND SUCH ITEM.

CONSTRUCTION LAYOUT/LIMITS OF CONSTRUCTION

6. THE CONTRACTOR SHALL OBTAIN THE SERVICES OF A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF FLORIDA FOR LAYOUT AND ESTABLISHMENT OF ELEVATIONS OF NEW WORK. PROOF OF LICENSE SHALL BE SUBMITTED TO THE ENGINEER BEFORE BEGINNING LAYOUT.

7. NO DISTURBANCE SHALL BE ALLOWED OUTSIDE OF THE RIGHT OF WAYS AND/OR THE LIMITS OF CONSTRUCTION SHOWN ON THE DRAWINGS UNLESS APPROVED BY THE OWNER OR SPECIFICALLY NOTED ON THE DRAWINGS.

EXISTING CONDITIONS

8. LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES ARE SHOWN BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE DRAWINGS BUT ARE NOT PURPORTED TO BE ABSOLUTELY CORRECT. THERE MAY BE OTHER IMPROVEMENTS, UTILITIES, ETC. WHICH ARE WITHIN THE PROJECT AREA. CONTRACTOR SHALL VERIFY, PRIOR TO CONSTRUCTION, THE LOCATIONS, ELEVATIONS, DIMENSIONS, TYPES, AND CONDITIONS OF ALL EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (WHETHER OR NOT SHOWN ON THE DRAWINGS) AFFECTING THE WORK.

9. PRIOR TO SHOP DRAWING PREPARATION AND SUBMITTAL AND PURCHASE OF RELATED MATERIALS, THE CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITIES (LOCATION, SIZE, MATERIALS OF CONSTRUCTION, OUTSIDE DIAMETER, WALL THICKNESS, ROUNDNESS, ELEVATIONS, ETC.) TO WHICH CONNECTION(S) WILL BE MADE. CONTRACTOR SHALL INCLUDE FIELD MEASUREMENTS ON SHOP DRAWINGS.

10. THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IN WRITING IMMEDIATELY IF CONFLICTS BETWEEN THE DRAWINGS AND ACTUAL CONDITIONS ARE DISCOVERED. THE CONTRACTOR SHALL ACCURATELY RECORD ANY SUCH CONFLICTS ON THE RECORD DRAWINGS.

11. ANY PROPERTY CORNERS, MONUMENTS, OR BENCH MARKS WITHIN THE PROJECT AREA SHALL BE PROTECTED UNLESS OTHERWISE INDICATED FOR DEMOLITION. IF ANY SUCH ITEMS ARE IN DANGER OF DAMAGE OR HAVE BEEN DAMAGED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER IMMEDIATELY AND REPLACE/RESTORE THESE ITEMS AT NO ADDITIONAL COST TO THE OWNER. IF OWNER CHOOSES TO SELF PERFORM THE WORK OR INCURS RELATED EXPENSES, THE CONTRACTOR SHALL REIMBURSE THE OWNER FOR ALL COSTS ASSOCIATED WITH THE EFFORT.

UTILITY COORDINATION

12. THE CONTRACTOR SHALL NOTIFY ALL UTILITIES NEAR THE PROJECT AREA AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE NOTIFYING "SUNSHINE 811 CALL OF FLORIDA" AT LEAST 48 HOURS PRIOR TO ANY DIGGING WORK TO HAVE ALL EXISTING UTILITIES LOCATED. THE PHONE NUMBER IS 1-800-432-4770 AND THE WEB SITE IS WWW.SUNSHINE811.COM, IN INSTANCES WHERE DIGGING OCCURS IN WETLANDS, THE NOTIFICATION PERIOD SHALL BE INCREASED FROM AT LEAST 48 HOURS TO AT LEAST 10 DAYS.

13. FLORIDA LAW (FS 553.851) REQUIRES THAT PERSONS MAKING EXCAVATIONS IN PUBLIC STREETS, ALLEYS, RIGHT-OF-WAYS OR UTILITY EASEMENTS MUST FIRST OBTAIN INFORMATION ON LOCATIONS OF UNDERGROUND GAS PIPELINES.

14. THE CONTRACTOR SHALL PRESERVE AND MAINTAIN EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES WITHIN THE PROJECT AREA. ANY DAMAGE SHALL BE REPAIRED BY AND AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.

15. THE CONTRACTOR IS RESPONSIBLE FOR BRACING, SHORING, OR PROVIDING OTHER MEANS NECESSARY TO PROTECT AND SUPPORT EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (EXPOSED OR UNEXPOSED) THAT MAY BE IMPACTED BY THE CONTRACTOR'S WORK.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING POWER/TELEPHONE COMPANIES AND ARRANGING TO HAVE UTILITIES POLES HELD AND/OR GUY WIRES REMOVED AND REPLACED, IF NECESSARY FOR CONSTRUCTION, AT NO ADDITIONAL COST TO THE OWNER.

SAFETY

17. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE FAMILIAR WITH THE OSHA EXCAVATION SAFETY STANDARDS AND TO ABIDE BY THEM AS COVERED UNDER THE FLORIDA TRENCH SAFETY ACT.

18. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION SAFETY.

RESTORATION

19. ALL PAVING, STABILIZED EARTH, DRIVEWAYS, CURBS, SIDEWALKS, FENCES, SOD, LANDSCAPING, CULVERTS, ETC. DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE RESTORED BY AND AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.

ACCESS/MAINTENANCE OF FACILITIES

20. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL EXISTING UTILITIES/FACILITIES AND MAINTAIN UNINTERRUPTED SERVICES THROUGHOUT THE CONTRACT PERIOD.

PIPING NOTES

21. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS. CONTRACTOR SHALL TAKE CARE TO PROVIDE PROPER GRADE ELEVATIONS AND ALIGNMENTS.

22. SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE. TYPE OF JOINT AND FITTING MATERIAL SHALL BE AS SPECIFIED FOR THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE.

23. CONTRACTOR SHALL CONSTRUCT NEW BELOW GRADE PIPING WITH A MINIMUM COVER OF 36". IF A MINIMUM COVER OF 36" CANNOT BE ACHIEVED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING.

24. CONTRACTOR SHALL INSTALL MINIMUM OF 1/4" THICK NEOPRENE PADDING BETWEEN PIPE AND SUPPORTS FOR DUCTILE IRON PIPE AND PIPE WITH COATINGS.

UTILITY SEPARATION

25. EACH PROPOSED UTILITY SHALL BE LAID TO ACHIEVE THE MINIMUM HORIZONTAL SEPARATION BETWEEN IT AND OTHER UTILITIES IN ACCORDANCE WITH THE TYPICAL UTILITY HORIZONTAL SEPARATION DETAIL AND FDEP REQUIREMENTS.

26. AT LOCATIONS WHERE A PROPOSED UTILITY CROSSES ANOTHER UTILITY, THE PROPOSED UTILITY SHALL BE INSTALLED IN ACCORDANCE WITH THE TYPICAL UTILITY CONFLICT DETAIL AND FDEP REQUIREMENTS.

27. IN THE EVENT THAT A UTILITY CONFLICT CAN NOT BE RESOLVED BY MAKING A MINOR ROUTE ADJUSTMENT OR BY UTILIZING THE TYPICAL UTILITY CONFLICT DETAIL, THE CONTRACTOR SHALL SUBMIT A RELOCATION PLAN TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCING WORK. ALL RELOCATION EFFORTS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER AND ANY AFFECTED UTILITY COMPANIES.

PROJECT SPECIFIC

28. ALL UTILITIES SHALL BE KEPT IN OPERATION EXCEPT WITH THE WRITTEN CONSENT OF THE UTILITY OWNER.

29. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING EXISTING UTILITIES AND PAVEMENT THAT THE CONTRACTOR DAMAGES DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER. REPAIRS SHALL BE CONDUCTED UNDER THE SUPERVISION OF THE OWNER AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND THESE DRAWINGS.

30. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF TWO WEEKS NOTICE TO THE OWNER PRIOR TO CONNECTING THE NEW CONSTRUCTION, EQUIPMENT, AND PIPING TO THE CITY OF ZEPHYRHILLS WWTF. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND SCHEDULING EACH CONNECTION WITH THE OWNER TO ENSURE THAT THERE ARE MINIMAL INTERRUPTIONS TO EACH SYSTEM.

31. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AND STABILIZING POWER POLES DURING CONSTRUCTION. THE CONTRACTOR SHALL CONTACT THE ELECTRIC UTILITY PROVIDER AND COORDINATE WITH THEM.

32. CONTRACTOR SHALL REMOVE TREE(S) WHEN IN DIRECT CONFLICT W/ PROPOSED WORK, AS APPROVED BY THE ENGINEER. CONTRACTOR SHALL OBTAIN PERMIT(S) REQUIRED.

33. PLEASE NOTE EXISTING UTILITIES AS SHOWN IN THE DRAWINGS ARE BASED ON AVAILABLE GIS DATA. CONTRACTOR SHALL VERIFY EXISTING UTILITIES LOCATIONS PRIOR TO CONSTRUCTION.

SPECIAL REQUIREMENTS TO HAND-DIG EXCAVATIONS FOR EXISTING UTILITY COORDINATION

34. PLEASE NOTE AREAS OF EXISTING UTILITIES IN CLOSE PROXIMITY TO THE PROPOSED INSTALLATION HAVE BEEN NOTED WITH DASHED RECTANGULAR BOXES SHOWN IN THE PLANS.

35. IN THE NOTED AREAS AND OTHER AREAS IDENTIFIED DURING CONSTRUCTION, THE CONTRACTOR SHALL HAND DIG ALL EXCAVATIONS WITHIN 10 FEET IN ALL DIRECTIONS OF A MARKED LOCATED UTILITY LINE.

36. THE CONTRACTOR SHALL ALSO HAND DIG A PILOT TRENCH WHEN CALLED FOR ON THE DIG PERMIT FOR ALL UNDERGROUND UTILITY WORK ALONG THE CENTERLINE OF NEW TRENCHES AND DOWN TO THE BOTTOM ELEVATION OF THE NEW UTILITY.

37. MACHINE EXCAVATION SHALL PROCEED ONLY AFTER IT IS DETERMINED THAT ALL EXISTING UTILITIES HAVE BEEN IDENTIFIED AND PROTECTED.

SOIL CONTAMINATION AREA

38. ONE AREA OF SOIL CONTAMINATION IS IDENTIFIED ON THE PLANS ON SHEET C8. AS A MINIMUM, THECONTRACTOR SHALL WEAR PPE WHEN WORKING IN SOIL OR GROUNDWATER IN THE AREA NOTED.

39. SOIL THAT IS DISTURBED SHALL NOT BE TAKEN OFF SITE. SOIL SHALL BE PLACED BACK WITHIN THE PROJECT BOUNDARY.

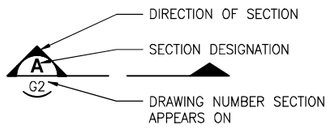
40. IN THE EVENT DEWATERING IS REQUIRED FOR THE INSTALLATION, THE CONTRACTOR SHALL CONFORM TO ENVIRONMENTAL REGULATIONS FOR THE PUMPING AND DISPOSAL OF GROUNDWATER FOR THE INSTALLATION. DEWATERING PLANS AND PERMITS SHALL INCLUDE A DETAILED SITE PLAN AND SHALL BE SUBMITTED TO THE OWNER PRIOR TO ANY WORK BEING PERFORMED IN AREAS WITH GROUNDWATER CONTAMINATION.

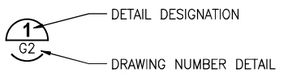
HORIZONTAL DIRECTIONAL DRILL NOTES

41. BORING LAYOUT BASED ON MINIMUM RADIUS OF 400 FEET. MAXIMUM BACK REAMER DIAMETERS SHALL BE
    19.8-INCH FOR 12-INCH DR-11 HDPE PIPE
    13.6-INCH FOR 6-INCH DR-11 HDPE PIPE

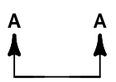
42. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNERS FOR ACCESS DURING UTILITY INSTALLATION.

43. BORE DEPTH ON BORES BENEATH FDOT ROADWAY PAVEMENT SHALL BE 10X THE BACK REAMER SIZE PER UAM 3.16.9.1.



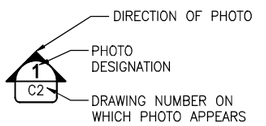


SECTION DESIGNATION



INDICATES ONE OR MORE SECTIONS CUT SHOWN ON THE SAME DETAIL

DETAIL DESIGNATION



SECTION DESIGNATION

PHOTO DESIGNATION

DRAWING INDEX

DWG. NO.	SHEET DESCRIPTION
GENERAL	
G1	COVER SHEET
G2	DRAWING INDEX, GENERAL NOTES AND DESIGNATION
G3	ABBREVIATIONS
G4	LEGENDS AND PIPE SCHEDULE
G5	SURVEY LEGEND AND NOTES
G6	KEY MAP
FORCEMAIN	
C1	FORCEMAIN PLANS
C2	FORCEMAIN PLANS
C3	FORCEMAIN PLANS
C4	FORCEMAIN PLANS
C5	FORCEMAIN PLANS
C6	FORCEMAIN PLANS
C7	FORCEMAIN PLANS
C8	FORCEMAIN PLANS
C9	FORCEMAIN PLANS
C10	FORCEMAIN PLANS
C11	FORCEMAIN PLANS
C12	FORCEMAIN PLANS
C13	FORCEMAIN PLANS
C14	FORCEMAIN PLANS
C15	FORCEMAIN PLANS
WATERMAIN	
C16	WATERMAIN PLANS
C17	WATERMAIN PLANS
C18	WATERMAIN PLANS
C19	WATERMAIN PLANS
C20	WATERMAIN PLANS
C21	WATERMAIN PLANS
C22	WATERMAIN PLANS
C23	WATERMAIN PLANS
CIVIL DETAILS	
C24	CIVIL DETAILS
C25	CIVIL DETAILS
C26	CIVIL DETAILS
C27	CIVIL DETAILS
C28	CIVIL DETAILS
EROSION CONTROL	
EC1	STORMWATER POLLUTION PREVENTION DETAILS
EC2	STORMWATER POLLUTION PREVENTION DETAILS
EC3	STORMWATER POLLUTION PREVENTION DETAILS

BID DOCUMENTS

SAVED: 8/13/2023 11:26 AM SSIMS Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\051-01 SOUTH 301 W-WW PIPELINES\DESIGN&CONSTRUCTION\CAD\DWGS\GENERAL\26110051101-G02.DWG

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

DRAWING INDEX, GENERAL NOTES AND DESIGNATION

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH A. FRASER, PE #57452 ON THE DATE SHOWN ON THE COVER SHEET.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

PROJECT NO: 26110-051-01
DATE: SEPT 2023
INDEX NO:
DWG NO: G2

Approved 2023-R-798-00197 James A. Meyer 11/6/2023

PLOTTED: 9/22/2023 2:57:49 PM KENNETH A. FRASER, PE

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STANDARD ABBREVIATIONS

&	AND
@	AT
A	AUTOMATIC
AA STD	ALUMINUM ASSOCIATION STANDARD
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AB	ALIGNMENT BEGINNING
AC	ASBESTOS CEMENT
AC	ALTERNATING CURRENT
AC	AIR CONDITIONER
ACI	AMERICAN CONCRETE INSTITUTE
ADJ	ADJUSTABLE
AE	ALIGNMENT END
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIP	ABANDONED IN PLACE
AISI	AMERICAN IRON STEEL INSTITUTE
AIT	ANALYTICAL INDICATING TRANSMITTER
ALT	ALTERNATIVE
ALUM	ALUMINUM
AM	AUTO-MANUAL
AMPS	AMPERES
ANSI	AMERICAN NATION STANDARDS INSTITUTE
AP	ANALYZER PANEL
APP	APPROVE, APPROVED
APPROX	APPROXIMATE
AR	AIR RELEASE
ARV	AIR RELEASE VALVE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASD	ADJUSTABLE SPEED DRIVE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AVE	AVENUE
AWG	AMERICAN WIRE GUAGE
AWS	AMERICAN WELDING SOCIETY
AWWA	AMERICAN WATER WORKS ASSOCIATION
B	BORING
B/	BOTTOM OF
B/L	BASELINE OF CONSTRUCTION
BC	BARE COPPER
BF	BLIND FLANGE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BKR	BREAKER
BLD	BLIND
BLDG	BUILDING
BLVD	BOULEVARD
BM	BENCH MARK
BMP	BEST MANAGEMENT PRACTICE
BO	BLOW-OFF
BTM	BOTTOM
BTM/	BOTTOM OF
BV	BALL VALVE
BYP	BYPASS
C	CONDUIT, CONDUCTOR, CLOSE
C/L, CL	CENTERLINE
CAM	COMPUTER-AUTO-MANUAL
CAT	CATALOGUE
CB	CIRCUIT BREAKER
CC	CENTER TO CENTER
CCS	CENTRAL CONTROL SYSTEM
CF	COLUMN FOUNDATION
CFWE	CABLE FURNISHED WITH EQUIPMENT
CI	CAST IRON
CIP	CAST IN PLACE, CAST IRON PIPE
CISP	CAST IRON SLIP PIECE
CJ	CONSTRUCTION/CONTRACTION JOINT
CLF	CHAIN LINK FENCE
CLR	CLEAR
CM	COMPUTER-MANUAL
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
CO	COMPANY
COL	COLUMN
COM	COMMUNICATION
CON	CONCENTRIC
CONC	CONCRETE
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CORP	CORPORATION
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CRE	CORROSION RESISTANT
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
CS	CARBON STEEL
CT	CURRENT TRANSFORMER, CABLE TRAY CONTACTOR
CTRD	CENTERED
CV	CHECK VALVE
D	DRAIN
DB	DUCT BANK
DBI	DITCH BOTTOM INLET
DC	DIRECT CURRENT
DES	DESIGNATION
DET	DETAIL
DI	DUCTILE IRON
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DIPS	DUCTILE IRON PIPE SIZE
DIV	DIVISION
DN	DOWN, DAMPER
DR	DIMENSION RATIO
DWG	DRAWING
DXS	DOUBLE EXTRA STRONG
E	EAST(ING)
EA	EACH
ECC	ECCENTRIC
EES	EMERGENCY EYEWASH AND SHOWER
EF	EACH FACE, EXHAUST FAN
EG	SUCH AS
EJ	EXPANSION JOINT
EL, ELEV	ELEVATION
ELB	ELBOW
ELEC	ELECTRICAL
EOP	EDGE OF PAVEMENT
EQ	EQUAL
ERCP	ELLIPTICAL REINFORCED CONCRETE PIPE
EST	ELEVATED STORAGE TANK
ETC	ETCETERA
EW	EACH WAY
EXIST	EXISTING
FBC	FLORIDA BUILDING CODE
F, FU	FUSE
F/F	FINISHED FLOOR
FAB	FABRICATED
FAC	FLORIDA ADMINISTRATIVE CODE
FCA	FLANGED COUPLING ADAPTER
FCV	FLOW CONTROL VALVE
FDEP	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
FDN	FOUNDATION
FDOT	FLORIDA DEPARTMENT OF TRANSPORTATION
FDR	FEEDER
FE	FLOW ELEMENT
FF	FINISHED FLOOR
FFE	FINISHED FLOOR ELEVATION
FG	FINISHED GRADE, FIBERGLASS
FH	FIRE HYDRANT
FIG	FIGURE
FIN	FINISHED
FIT	FLOW INDICATING TRANSMITTER
FJ	FLANGED JOINT
FL	FLOOR
FLEX	FLEXIBLE
FLG	FLANGE(D)
FND	FOUNDATION
FNPT	FEMALE NATIONAL PIPE THREAD
FO	FIBER OPTIC
FOS	FAST-OFF-SLOW
FOSA	FAST-OFF-SLOW-AUTO
FOSR	FAST-OFF-SLOW-REMOTE
FP	FULL PENETRATION, FIELD PANEL
FR	FORWARD-REVERSE
FREQ	FREQUENCY
FRP	FIBER REINFORCED PLASTIC
FS	FLORIDA STATUTES, FAR SIDE, FLOW SWITCH
FT	FOOT
G	GROUND
GAL	GALLON
GALV	GALVANIZED
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERUPTER
GND	GROUND
GPM	GALLONS PER MINUTE
GR	GRADE
GRTG	GRATING
GS	GALVANIZED STEEL
GSP	GALVANIZED STEEL PIPE
GST	GROUND STORAGE TANK
GV	GATE VALVE
H	HIGH
HA	HAND AUGER
HD	HAND
HDD	HORIZONTAL DIRECTIONAL DRILL
HDNS	HARDNESS
HDPE	HIGH DENSITY POLYETHYLENE
HHWL	HIGH HIGH WATER LEVEL
HK	HOOK
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HR	HANDRAIL
HSP	HIGH SERVICE PUMP
HT	HEIGHT
HWL	HIGH WATER LEVEL
I&C	INSTRUMENTATION AND CONTROL
IC	INTERRUPTING CAPACITY
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
IF	INSULATED FLANGE
IJ	ISOLATION JOINT
INC	INCORPORATED
IPS	IRON PIPE SIZE
J, JB	JUNCTION BOX
JT	JOINT
KA	KILOAMPERES
KB	KNEE BRACE
KCMIL	THOUSAND CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT AMPERES
KW	KILOWATTS
KWH	KILOWATT HOUR
L	LOWER
LB, LBS	POUND(S)
LE	LEVEL ELEMENT
LEL	LOWER EXPLOSIVE LIMIT
LF	LINEAR FEET
LG	LONG
LIT	LEVEL INDICATING TRANSMITTER
LIU	LIGHT INTERFACE UNIT
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LLWL	LOW LOW WATER LEVEL
LOS	LOCKOUT STOP
LR	LONG RADIUS, LOCAL-REMOTE
LS	LIFT STATION
LSIG	LONG SHORT INSTANTANEOUS GROUND
LWL	LOW WATER LEVEL
M	MAGNETIC CONTACTOR COIL, MOTOR, MANUAL
M/F	MALE/FEMALE
MAX	MAXIMUM
MC	MODULATE-CLOSE
MCC	MOTOR CONTROL CENTER
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MES	MITERED END SECTION
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MNPT	MALE NATIONAL PIPE THREAD
MO	MOTOR OPERATOR
MP	METERING PUMP
MPH	MILES PER HOUR
MS	MOTOR STARTER
MSC	MANUFACTURER SUPPLIED CABLE
MT, MTD	MOUNT(ED)
MTL	METAL
MV	MEDIUM VOLTAGE
N	NORTH(ING), NEUTRAL, NORMAL
N/A	NOT APPLICABLE
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NC	NORMALLY CLOSED
NE	NORTH EAST
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NPT	NATIONAL PIPE THREAD
NPW	NON POTABLE WATER
NRS	NONRISING STEM
NS	NEAR SIDE
NSF	NATIONAL SANITATION FOUNDATION
NTS	NOT TO SCALE
NW	NORTH WEST
OC	ON CENTER(S), OPEN-CLOSE(D)
OCA	OPEN-CLOSE-AUTO
OCR	OPEN-CLOSE-REMOTE
OD	OUTSIDE DIAMETER
OF	OVERFLOW
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
OPP	OPPOSITE
ORP	OXIDATION REDUCTION POTENTIAL
OS&Y	OUTSIDE STEM AND YOKE
OSC	OPEN-STOP-CLOSE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
P&ID	PIPING AND INSTRUMENTATION DIAGRAM
P/L	PROPERTY LINE
PB	PULL BOX
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PCV	PRESSURE CONTROL VALVE
PE	PLAIN END, POLYETHYLENE
PET	POLYETHYLENE TUBING
PF	POWER FACTOR
pH	HYDROGEN ION CONCENTRATION
PH	PHASE
PI	POINT OF INTERSECTION/PLANT INFLUENT
PID	PROPORTIONAL INTEGRAL DERIVATIVE
PIT	PRESSURE INDICATING TRANSMITTER
PIV	POST INDICATOR VALVE
PL	PLATE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PLCS	PLACES
POC	POINT OF CONNECTION
POE	POINT OF ENTRY
POJ	PUSH ON JOINT
PP	POWER POLE
PPE	PERSONAL PROTECTIVE EQUIPMENT
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSID	POUNDS PER SQUARE INCH DIFFERENTIAL
PSIG	POUNDS PER SQUARE INCH GAUGE
PSV	PRESSURE SUSTAINING VALVE
PT	PRESSURE TREATED, POTENTIAL TRANSFORMER
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PW	POTABLE WATER
PWR	POWER
R	RADIUS
R/W, ROW	RIGHT-OF-WAY
RCP	REINFORCED CONCRETE PIPE
RCPT	RECEPTACLE
RED	REDUCER
REF	REFERENCE
REINF	REINFORCEMENT, REINFORCING
REQ, REQ'D	REQUIRED
RGS	RIGID GALVANIZED STEEL
RJ	RESTRAINED JOINT
RM	REMOTE MULTIPLEXING MODULE
RMS	ROOT MEAN SQUARE
RPZ	REDUCED PRESSURE ZONE
RT	RIGHT
RTU	REMOTE TELEMETRY UNIT
SARV	SURGE ANTICIPATOR RELIEF VALVE
SBC	STANDARD BUILDING CODE
SCH	SCHEDULE
SCJ	SAW CUT JOINT
SDI	STEEL DECK INSTITUTE
SE	SOUTH EAST
SEC	SECOND
SF	SLOWER-FASTER
SHEC	SHOULDERED-END COUPLING
SHT	SHEET
SIM	SIMILAR
SJI	STEEL JOINT INSTITUTE
SM	STATIC MIXER
SP	SPACING, SPACED
SPD	SURGE PROTECTIVE DEVICE
SQ	SQUARE
SR	STATE ROAD, SURGE RELIEF
SRV	SURGE RELIEF VALVE
SS	START-STOP
SS, SST	STAINLESS STEEL
SSC	SUPERVISORY SET POINT CONTROL
SSRV	SOLID STATE REDUCED VOLTAGE
ST	SHUNT TRIP
STA	STATION
STD	STANDARD
STL	STEEL
STS	STORMWATER SEWER
SW	SOUTH WEST, SWITCH
SWD	SIDE WATER DEPTH
SWJ	SOLVENT WELD JOINT
SWPPP	STORM WATER POLLUTION PREVENTION PLAN
SY	SQUARE YARD
T, THK	THICK
T/	TOP OF
T/B,T&B	TOP AND BOTTOM
TBM	TEMPORARY BENCHMARK
TEMP	TEMPERATURE
TGS	THREADED GALVANIZED STEEL
TGSP	THREADED GALVANIZED STEEL PIPE
TH	TOTAL HEAD
THERMO	THERMOSTATIC
THD	THREADED
TJB	TERMINAL JUNCTION BOX
TK	TANK
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TOSJ	TOP OF STEEL JOIST
TOW	TOP OF WALL
TS	TUBULAR STEEL
TSF	THICKENED SLAB FOOTING
TSP	TWISTED SHIELDED PAIR
TURB	TURBIDITY
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITER'S LABORATORIES
ULC	ULTRASONIC LEVEL CONTROLLER
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTAGE, VOLTS
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VH	VAPOR HEATER
VIB	VIBRATION
VIF	VERIFY IN FIELD
VP	VAPORIZER
W	WIDE, WATT
W/	WITH
W/O	WITHOUT
WCJ	WALL CONTROL JOINT
WF	WALL FOOTING
WGT	WEIGHT
WP	WORK POINT, WEATHERPROOF
WSE, WSEL	WATER SURFACE ELEVATION
WT	WEIGHT
WV	WATER VALVE
WWF	WELDED WIRE FABRIC
XFMR	TRANSFORMER
XS	EXTRA STRONG

CUSTOM ABBREVIATIONS

COZ	CITY OF ZEPHYRHILLS
SWFWMD	SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
ISO	ISOMETRIC
EOR	ENGINEER OF RECORD
FM	FORCE MAIN
WM	WATER MAIN

NOTES:
1. SEE LEGENDS AND PIPE SCHEDULE FOR ADDITIONAL ABBREVIATIONS.
2. NOT ALL ABBREVIATIONS MAY BE USED FOR THIS PROJECT.

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

ABBREVIATIONS

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MECHANICAL LEGEND

CIVIL LEGEND

- CONTOURS (90)
- MATCHLINE
- RIGHT-OF-WAY BOUNDARY
- PROPERTY BOUNDARY
- EASEMENT BOUNDARY
- CENTERLINE
- WATERMAIN LINE (WM)
- FORCE MAIN (FM)
- GAS LINE (G)
- ELECTRICAL LINE (E)
- CHLORINE LINE
- SILT FENCE (SF)
- TURBIDITY BARRIER (TB)
- DEMO HATCH
- WETLAND (WL)
- SPOT ELEVATION (+100.00)
- REINFORCED CONCRETE PIPE (RCP)
- TRENCH DRAIN
- MITERED END SECTION W/ STRUCTURE DESIGNATION (S-1)
- FLARED END SECTION W/ STRUCTURE DESIGNATION (S-1)
- DITCH BOTTOM INLET W/ STRUCTURE DESIGNATION (S-1)
- COORDINATE POINT
- PROPOSED SIGN
- CONCRETE
- LIMEROCK
- COMPACTED SOIL
- GRAVEL
- ASPHALT RESTORATION
- FORCEMAIN FLOW DIRECTION
- POTENTIAL UTILITY CONFLICT

PIPING SYMBOLS

DOUBLE LINE	SINGLE LINE	
		PIPE
		WELDED PIPE
		FLANGED JOINT
		MECHANICAL JOINT OR RESTRAINED PUSH-ON JOINT
		FLEXIBLE COUPLING ADAPTER
		EXPANSION JOINT
		HUB & SPIGOT JOINT
		BALL JOINT
		FLANGED COUPLING ADAPTER W/ THRUST TIES
		FLEXIBLE COUPLING WITH THRUST TIES
		BLIND FLANGE
		ELBOW UP
		ELBOW DOWN
		TEE UP
		TEE DOWN
		FEMALE QUICK DISCONNECT FITTING
		MALE QUICK DISCONNECT FITTING

DOUBLE LINE	SINGLE LINE	
		LATERAL UP
		LATERAL DOWN
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		UNION
		CAP
		ANCHOR
		WYE
		TEE
		CROSS
		ELBOW, 90 DEGREE
		ELBOW, 45 DEGREE
		ELBOW, 22.5 DEGREE
		ABANDON IN PLACE
		DEMOLISH AND REMOVE

VALVE SYMBOLS

- GATE
- BUTTERFLY
- BALL
- CHECK
- DIAPHRAGM
- NEEDLE
- PRESSURE RELIEF
- AIR RELEASE AND/OR VACUUM RELIEF
- REGULATED SIDE HYDRAULIC CONTROL VALVE

ACTUATOR SYMBOLS

- M XX — ELECTRIC MOTOR
- EH XX — ELECTROHYDRAULIC
- P XX — PNEUMATIC
- H XX — HYDRAULIC
- S — SOLENOID
- MANUAL

NOTE:

ON LOSS OF PRIMARY POWER
(PNEUMATIC, ELECTRICAL OR HYDRAULIC)
XX: FO = FAIL OPEN
FC = FAIL CLOSED
FLP = FAIL TO LAST POSITION

PIPE SUPPORT SYMBOLS

- U-SHAPED PIPE SUPPORT
- FLANGED PIPE SUPPORT
- PIPE SUPPORT W/ AXIAL LOAD SUPPORT

PIPE SCHEDULE NOTES:

GENERAL NOTES:
1. COAT BURIED AND SUBMERGED PIPE PER PIPE SPECIFICATIONS.
2. TEST LINES PER SECTION 15144 UNLESS NOTED OTHERWISE.
3. LABEL ALL PIPING PER SECTION 15075.

RESTRAINT SYSTEM NOTES:
(1) SEE RESTRAINT DETAILS C24

SPECIFIC NOTES:
(A) DISINFECT PIPING PER SECTION 15141.
(B) APPLY ABOVE GRADE PAINT SYSTEM ONLY TO PIPING EXPOSED TO SUNLIGHT. PIPING UNDER FACILITY CANOPY STRUCTURE SHALL BE CLASSIFIED AS EXPOSED TO SUNLIGHT.
(C) BURIED DUCTILE IRON PIPE SHALL BE POLYETHYLENE WRAPPED PER SECTION 15155 PART 2.11.

PIPE SCHEDULE

ABBREVIATION	FLOW STREAM IDENTIFICATION	PIPE/DUCT MATERIAL	PIPE MATERIAL ABBREV	DIMENSION RATIO (DR)	SPECIFICATION NUMBER	PIPE LINING	NORMAL MAX OPERATING PRESSURE (PSIG)	FIELD TEST PRESSURE (PSIG)	EXPOSED PIPE PAINT SYSTEM	COLOR CODE	SPECIFIC NOTES	RESTRAINT SYSTEM NOTES
FM-1	FORCE MAIN	POLYVINYL CHLORIDE	PVC	18	15291	N/A		150	N/A	GREEN	N/A	(1)
FM-2	FORCE MAIN	DUCTILE IRON	DI	N/A	15155	EPOXY		150	N/A	GREEN	N/A	(1)
FM-3	FORCE MAIN	HIGH DENSITY POLYETHYLENE	HDPE	11	15146	N/A		160	N/A	GREEN	N/A	(1)
WM-1	WATER MAIN	POLYVINYL CHLORIDE	PVC	18	15291	N/A		150	N/A	BLUE	(A)	(1)
WM-2	WATER MAIN	HIGH DENSITY POLYETHYLENE	HDPE	11	15146	N/A		160	N/A	BLUE	(A)	(1)

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

LEGENDS AND PIPE SCHEDULE

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SURVEYOR'S NOTES:

1. USE OF THIS SURVEY FOR PURPOSES OTHER THAN INTENDED, WITHOUT WRITTEN VERIFICATION, WILL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO THE SURVEYOR. NOTHING HEREIN SHALL BE CONSTRUED TO GIVE ANY RIGHTS OR BENEFITS TO ANYONE OTHER THAN THOSE CERTIFIED TO. THIS SURVEY MEETS THE "STANDARDS OF PRACTICE" SET FORTH BY THE FLORIDA BOARD OF LAND SURVEYORS IN CHAPTER 5J-17 FLORIDA ADMINISTRATIVE CODE.
2. THIS SURVEY WAS PREPARED WITHOUT AN ABSTRACT OF TITLE; THEREFORE THE UNDERSIGNED MAKES NO GUARANTEES OR REPRESENTATIONS REGARDING INFORMATION SHOWN HEREON PERTAINING TO EASEMENTS, RIGHTS-OF-WAY, SETBACK LINES, AGREEMENTS, RESERVATIONS, OR OTHER SIMILAR MATTERS.
3. NO INSTRUMENTS OF RECORD REFLECTING EASEMENTS, RIGHT-OF-WAYS AND/OR OWNERSHIP WERE FURNISHED TO THE UNDERSIGNED EXCEPT AS SHOWN.
4. NO UNDERGROUND INSTALLATIONS, IMPROVEMENTS OR ENCROACHMENTS, HAVE BEEN LOCATED EXCEPT THOSE SHOWN HEREON.
5. ELEVATIONS SHOWN HEREON ARE BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), NATIONAL GEODETIC SURVEY BENCHMARK "D 663", LOCATED ALONG GALL BOULEVARD IN ZEPHYRHILLS, FL, PUBLISHED ELEVATION = 79.39' (NAVD88).
6. BEARINGS AND DISTANCES SHOWN HEREON ARE FIELD MEASURED, UNLESS OTHERWISE INDICATED.
7. THE TEXT FOR TIES TO IMPROVEMENTS INDICATES THE DIRECTION THEY LIE IN RELATION TO THE BOUNDARY.
8. SUBJECT PROPERTY MAY CONTAIN LANDS THAT ARE SUBJECT TO JURISDICTION OR RESTRICTION BY ONE OR MORE OF THE FOLLOWING AGENCIES: ARMY CORP. OF ENGINEERS, SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (S.W.F.W.M.D.) OR FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (F.D.E.P.).

SURVEYOR'S LEGEND

- IP, IR = IRON PIPE, IRON ROD
- R/W = RIGHT-OF-WAY
- EL. = ELEVATION
- I.E. = INVERT ELEVATION
- F.F. = FINISHED FLOOR ELEVATION
- RCP = REINFORCED CONCRETE PIPE
- CMP = CORRUGATE METAL PIPE
- = SET 5/8" IR "DC JOHNSON LB 4514"
- = SET NAIL & DISK "LB 4514"
- = VERTICAL CONTROL BENCHMARK
- = POWER POLE/TELEPHONE POLE
- = LIGHT POLE
- = METER POLE
- = GUY POLE
- = GUY ANCHOR
- = BOLLARD
- = POST
- = ROADSIGN
- = REFLECTOR SIGN
- = MAILBOX
- = AIR CONDITIONER
- MW = MONITORING WELL
- = CHAIN LINK FENCE
- = VINYL FENCE
- = WIRE FENCE
- = WOOD FENCE
- SPOT = SPOT ELEVATION
- = OAK TREE (SIZE AS NOTED)
- = PALM TREE (SIZE AS NOTED)
- = PINE TREE (SIZE AS NOTED)
- = TREE (UNKNOWN VARIETY)
- = WATER METER
- = GATE VALVE - WATER
- = BACKFLOW PREVENTER - WATER
- = WATER LINE WITNESS POST
- = FIRE HYDRANT
- = GATE VALVE - FIRE
- = UTILITY VAULT/HAND HOLE
- = ELECTRIC METER
- = ELECTRIC BOX
- OHP = OVERHEAD POWER LINE
- = GAS LINE WITNESS POST
- = GAS VALVE
- GAS = GAS LINE
- = TELEPHONE EQUIPMENT BOX
- = TELEPHONE PEDESTAL
- = TELEPHONE VAULT/HAND HOLE
- = TELEPHONE RELEASE VALVE
- = TELEPHONE LINE WITNESS POST
- OHT = OVERHEAD TELEPHONE LINE
- = FIBER OPTIC VAULT/HAND HOLE
- = FIBER OPTIC WITNESS POST
- = ASPHALT
- = CONCRETE
- = GRAVEL/DIRT ROAD

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

SURVEY LEGEND AND NOTES

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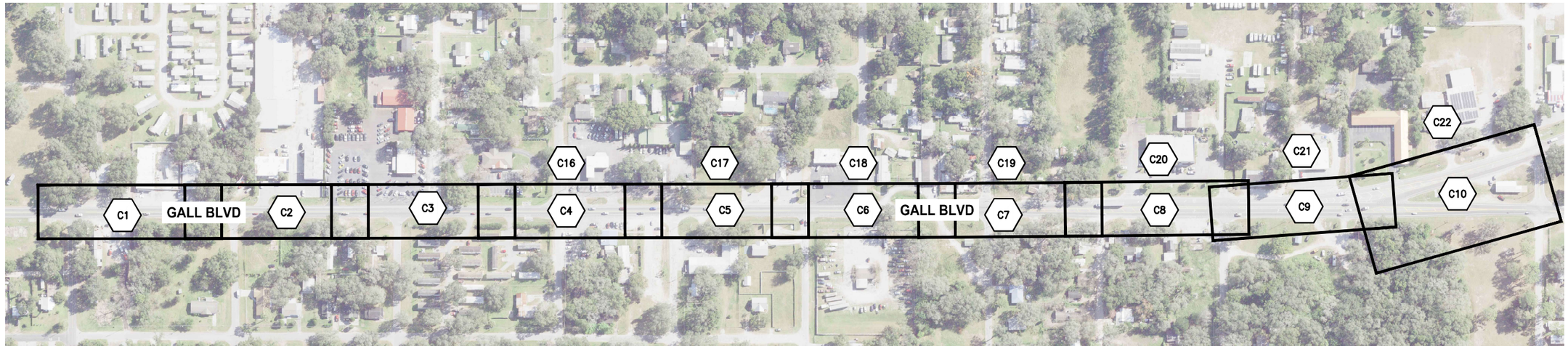
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GRAPHIC SCALE

0 75 150 300

SCALE IN FEET

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

KEY MAP

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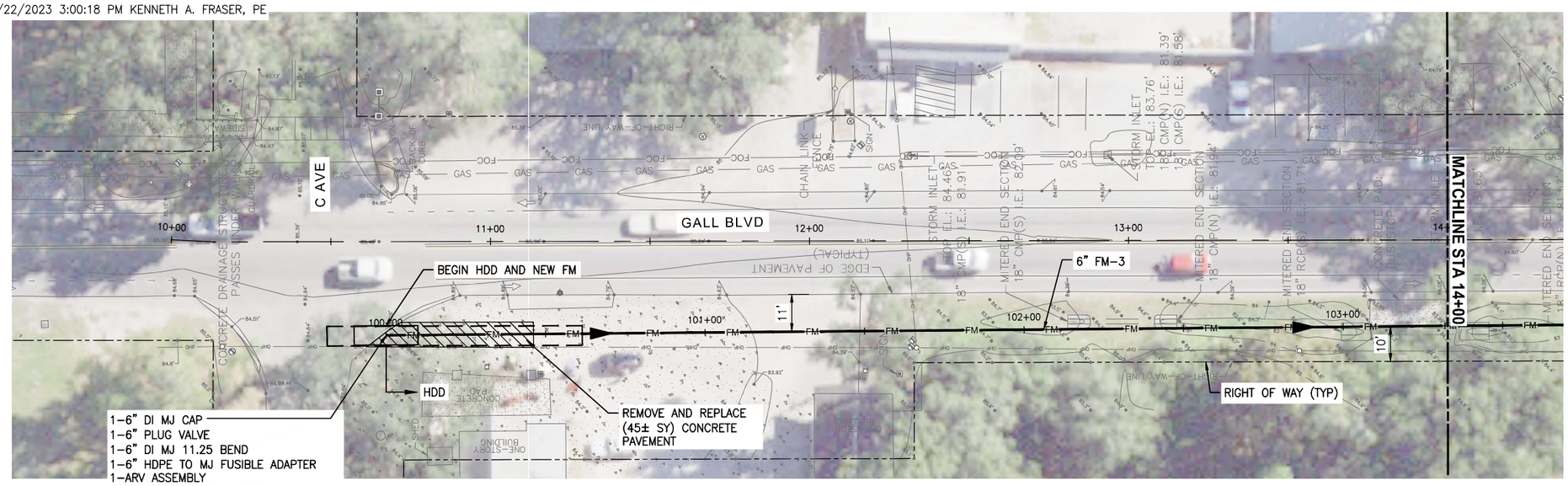
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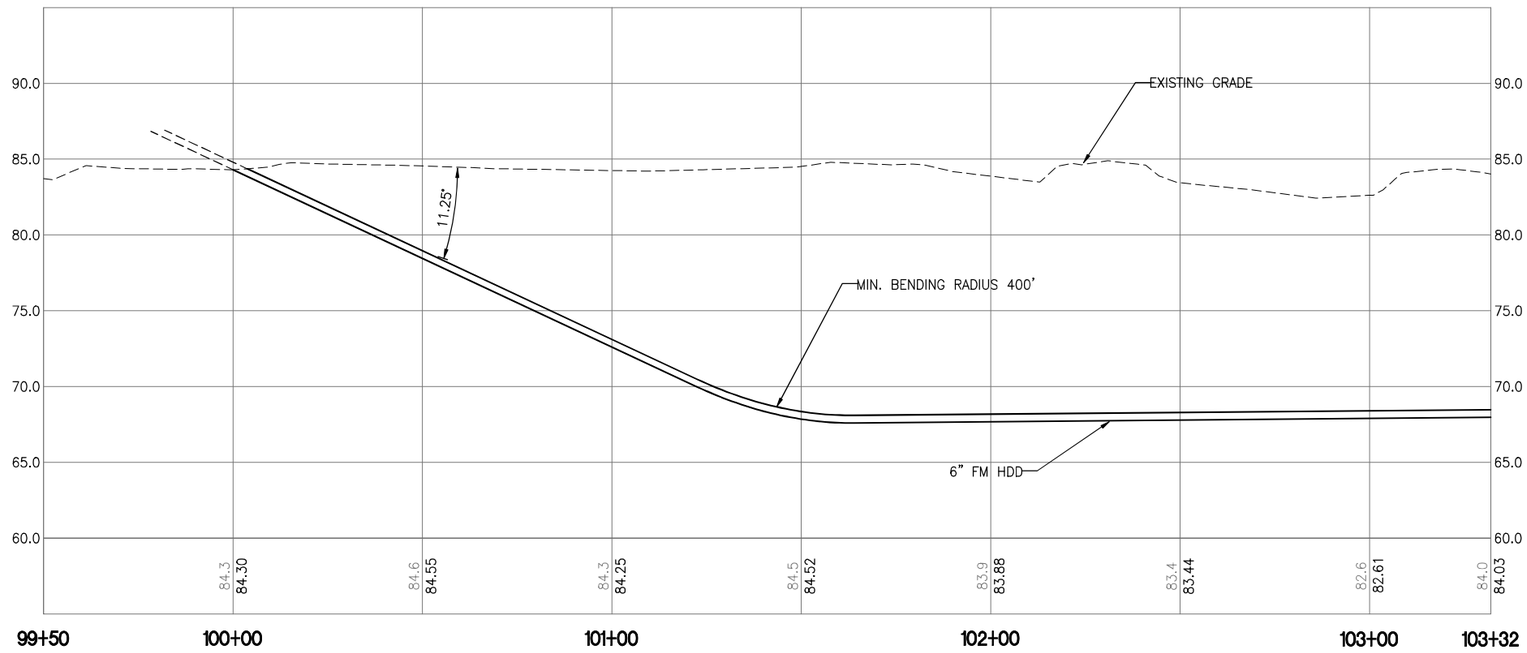
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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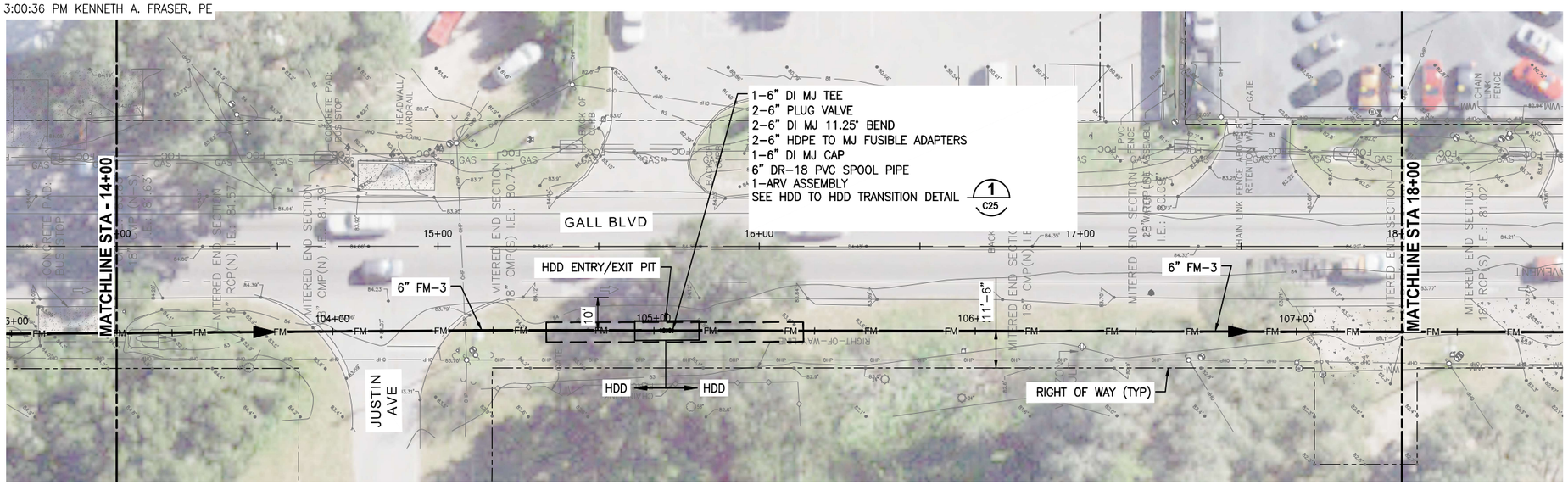
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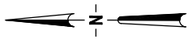
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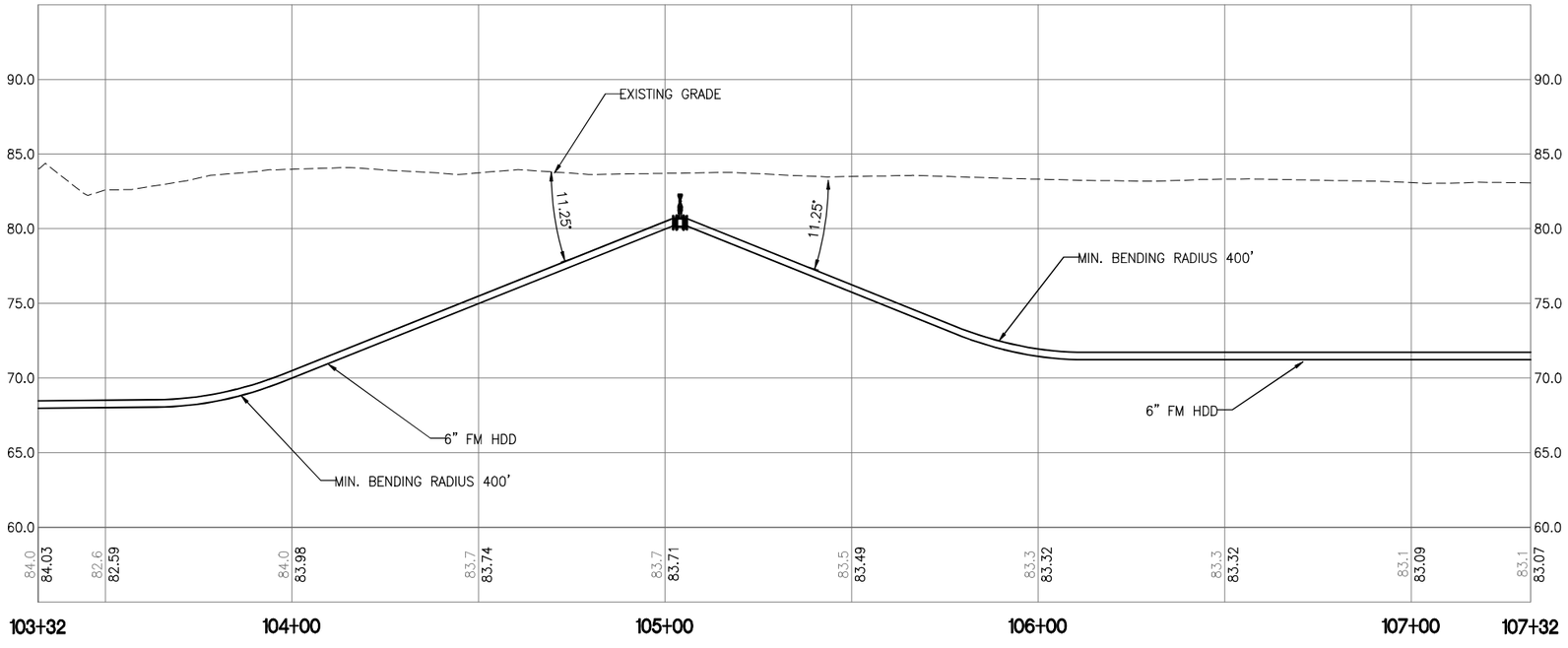
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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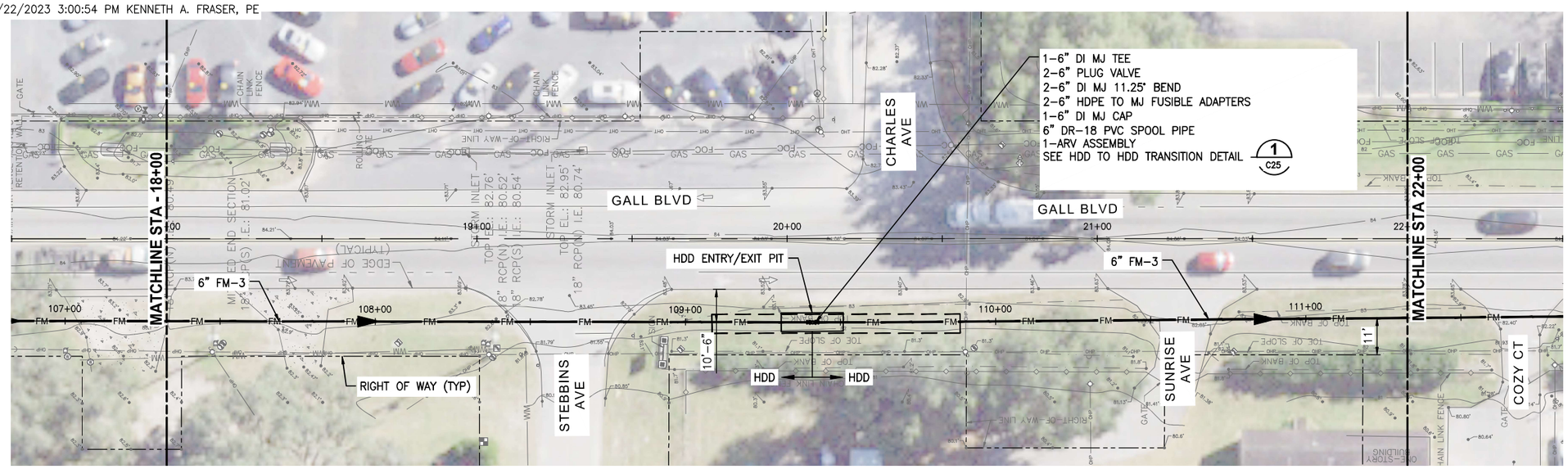
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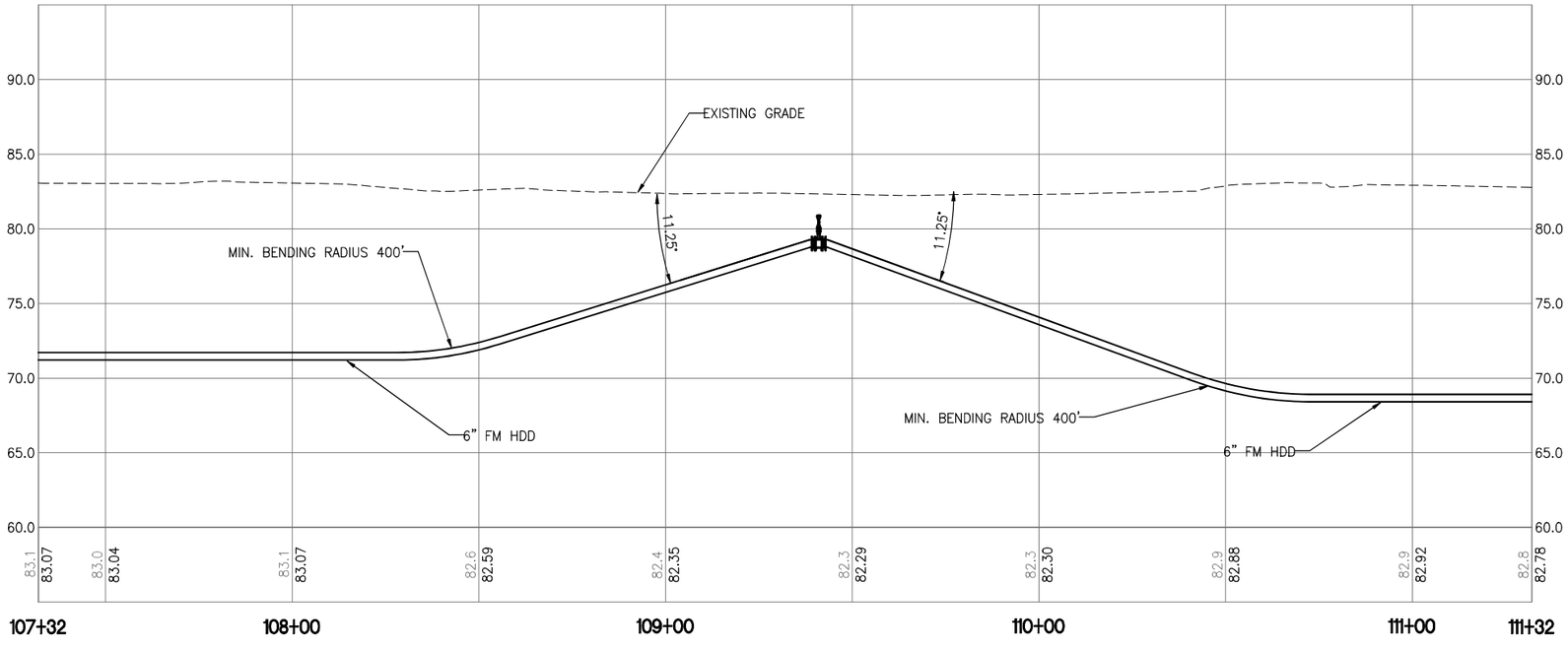
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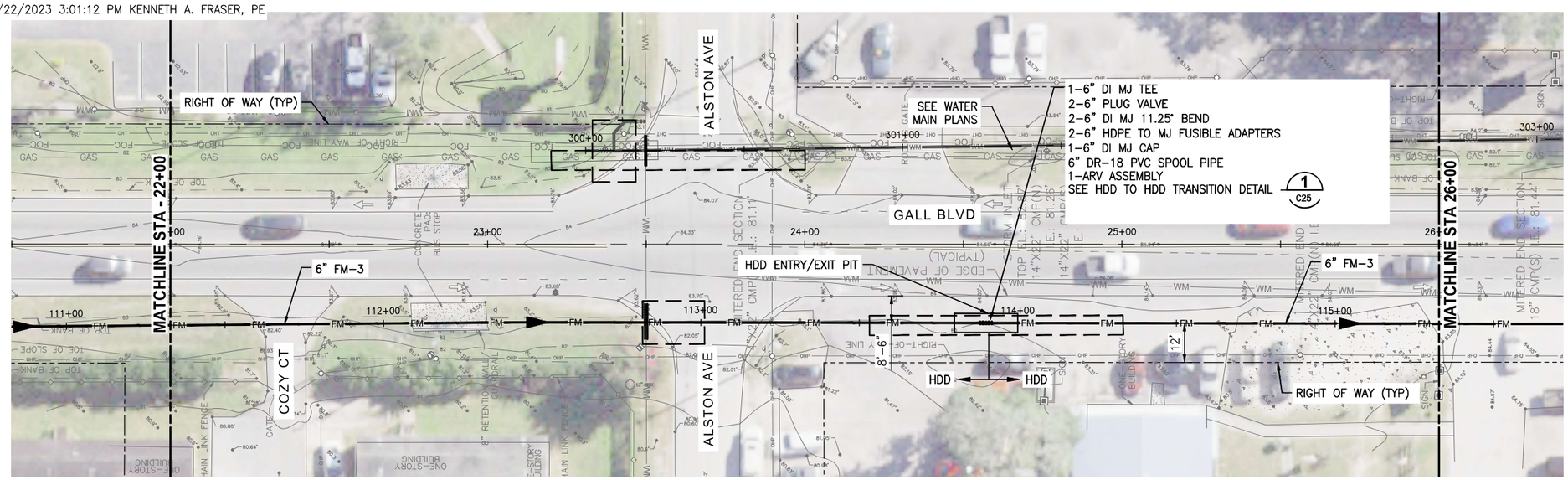
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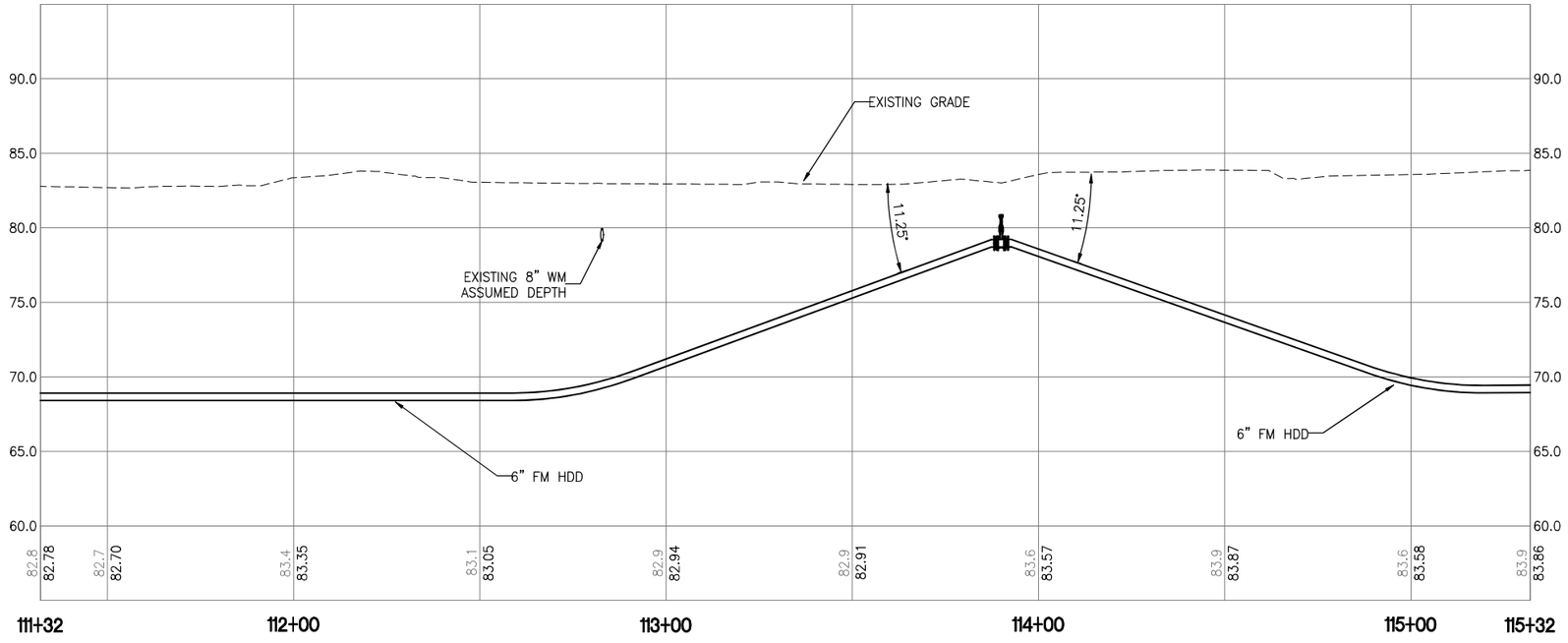
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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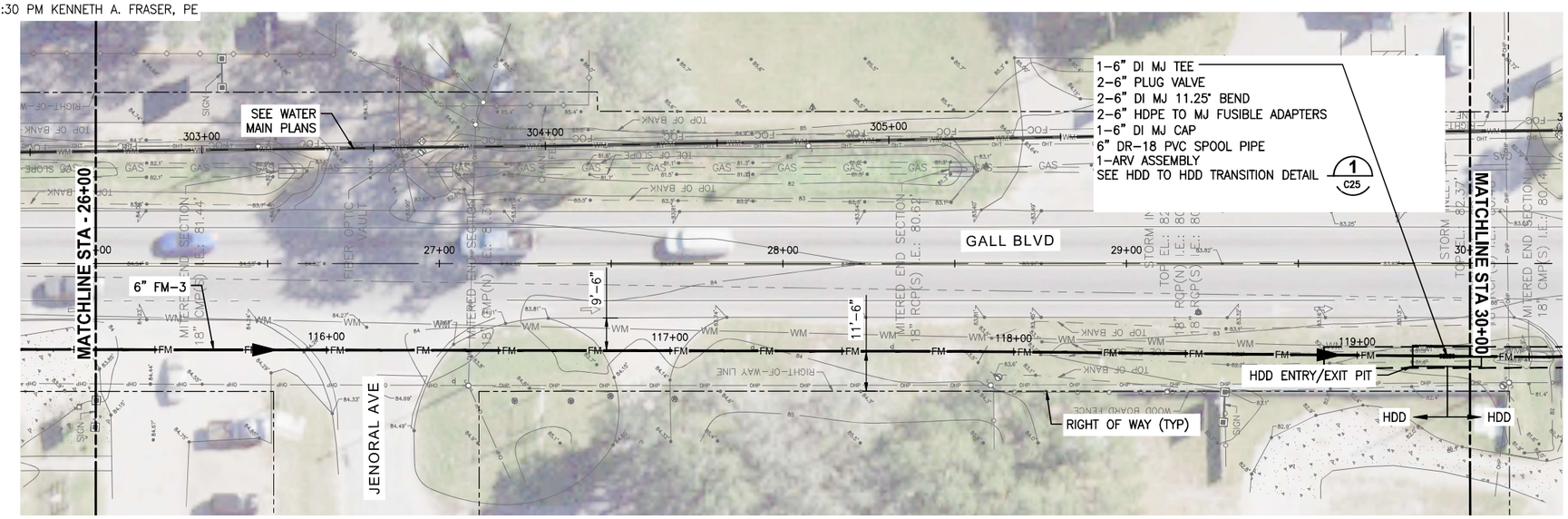
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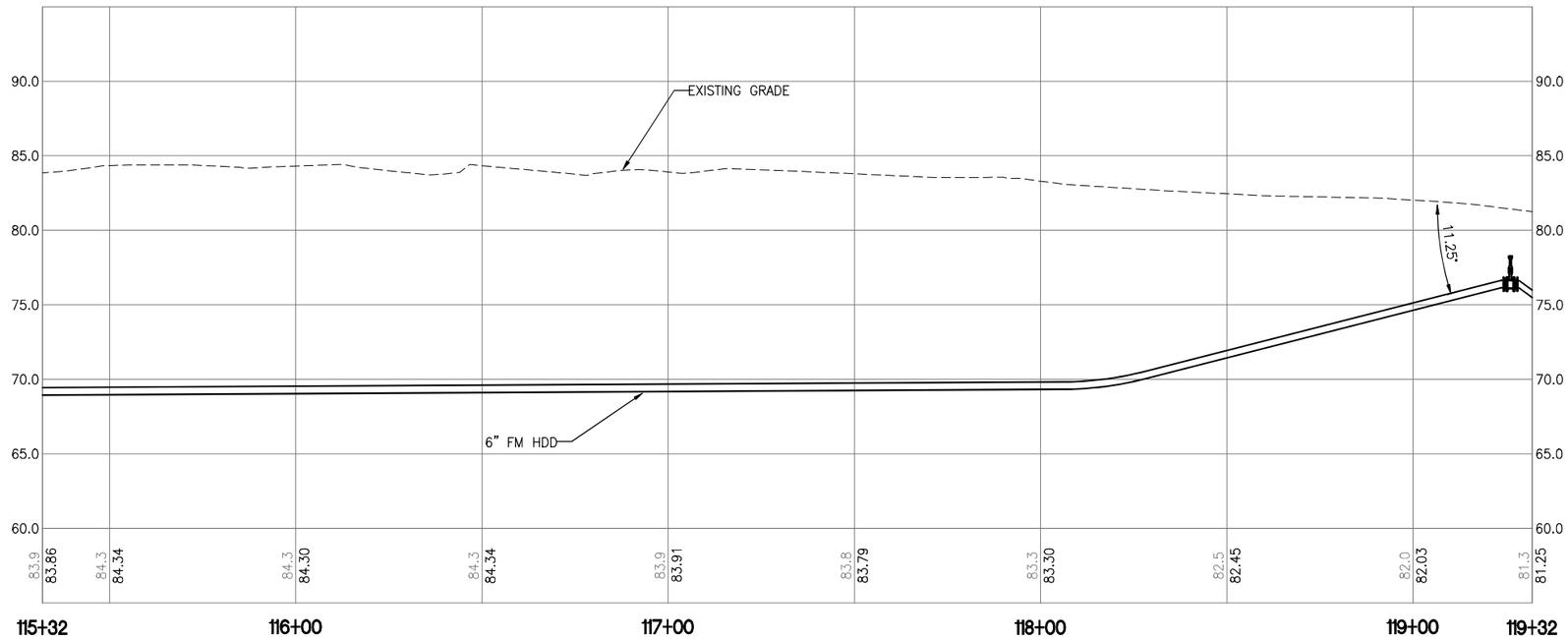
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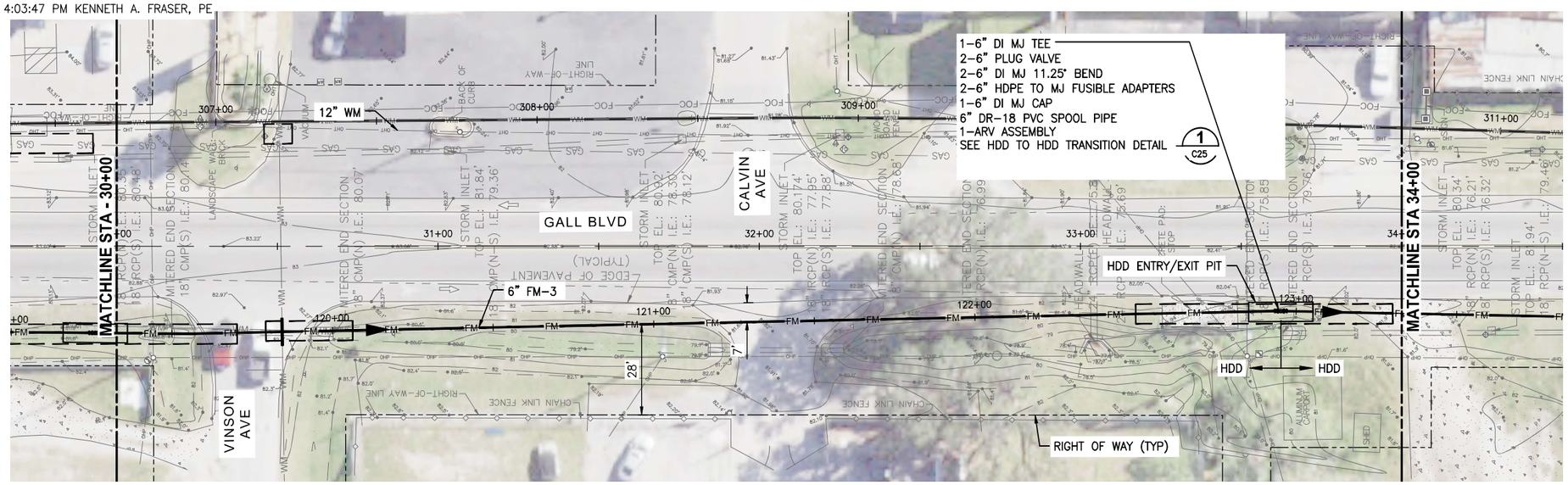
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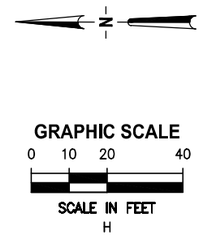
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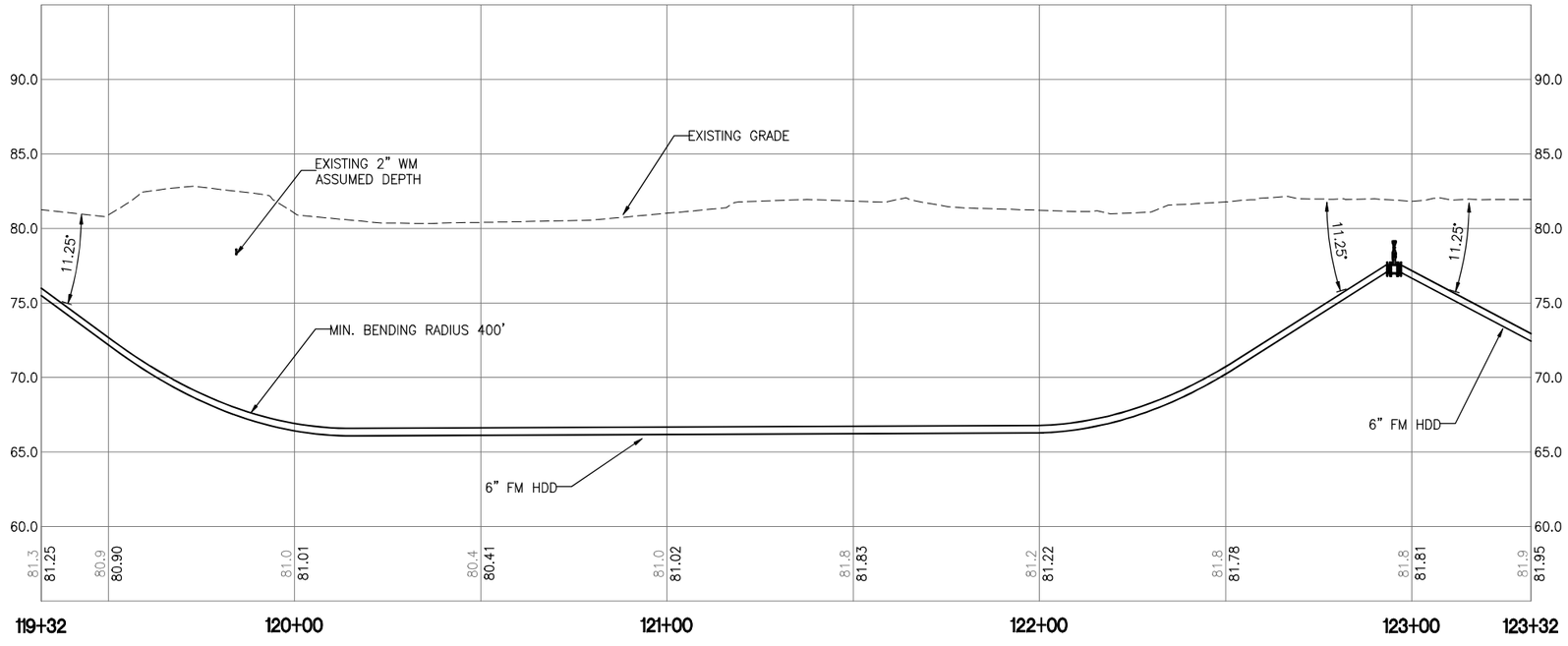
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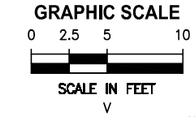
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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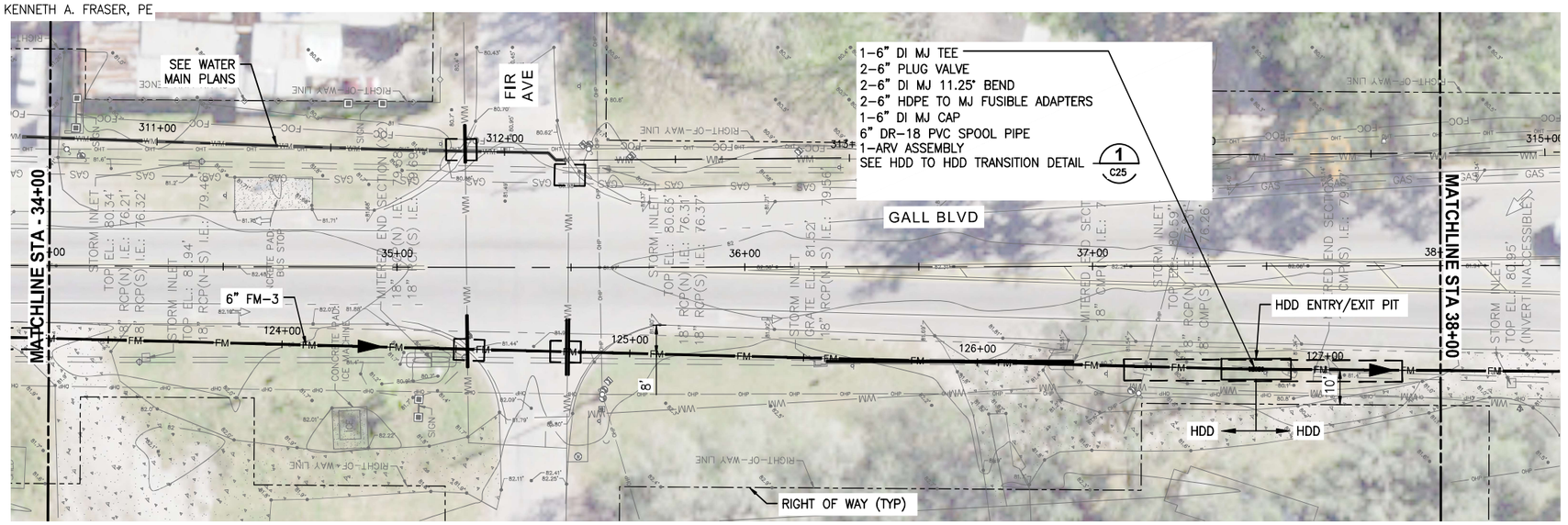
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INDEX NO:
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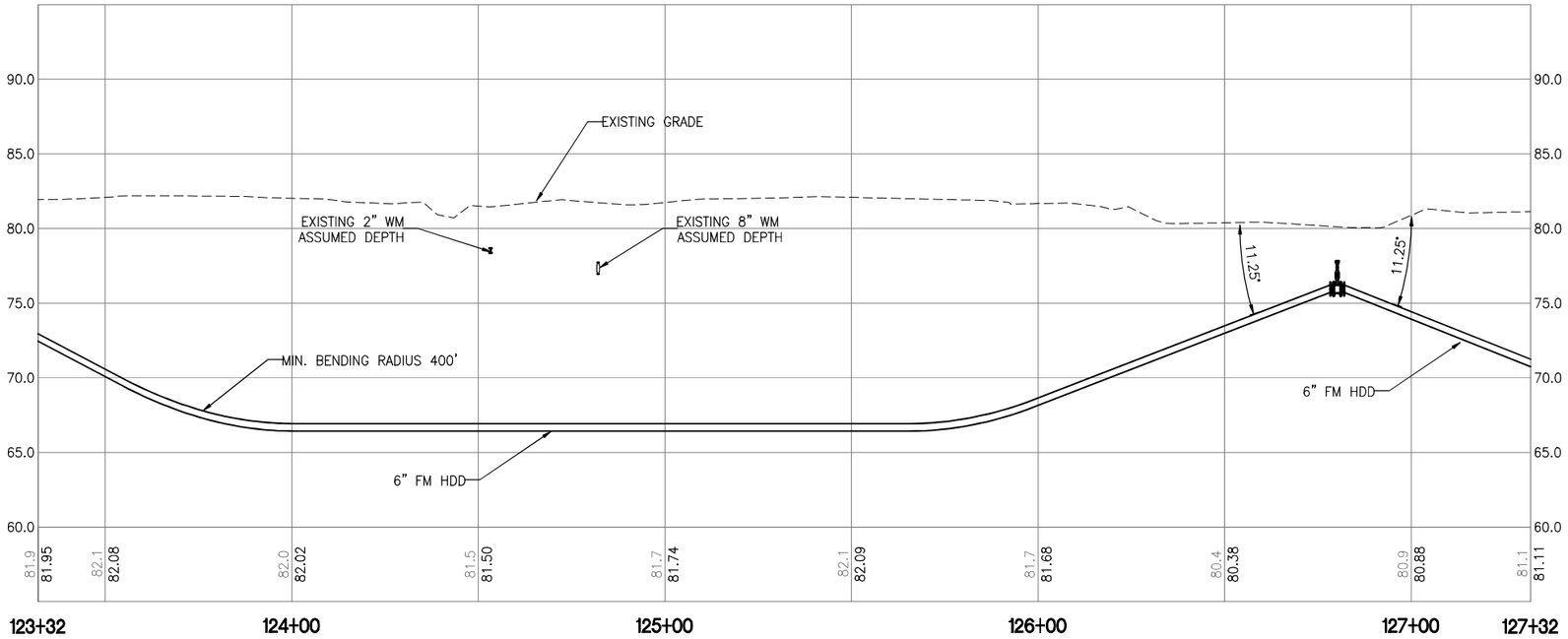
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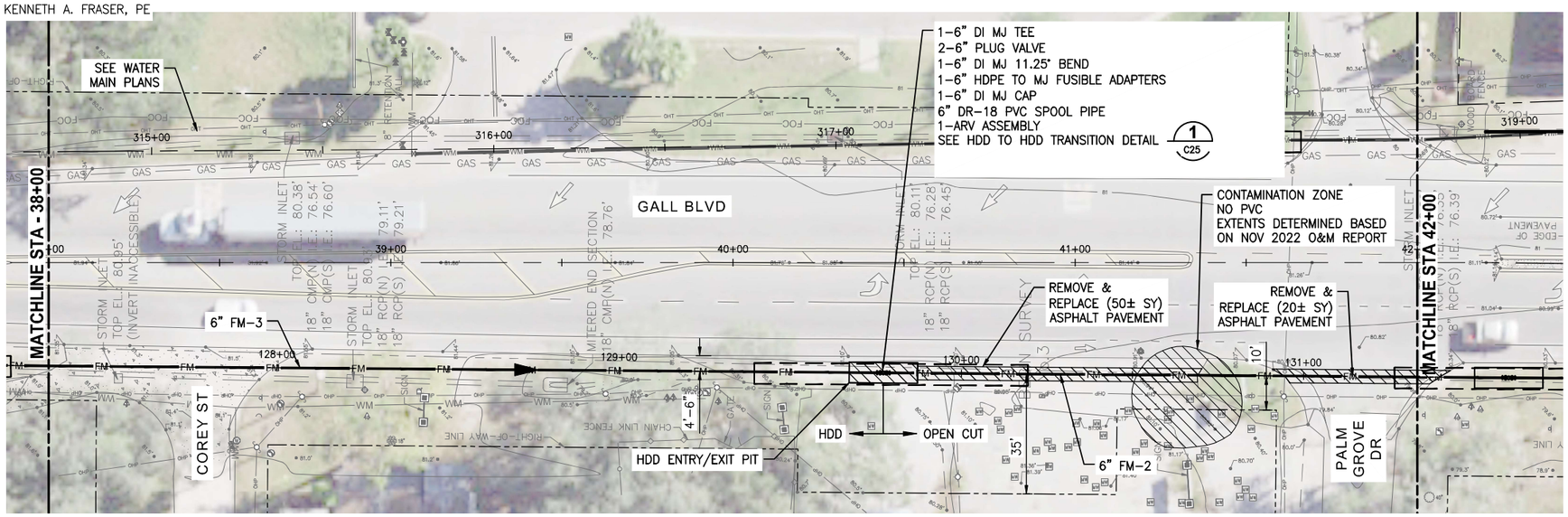
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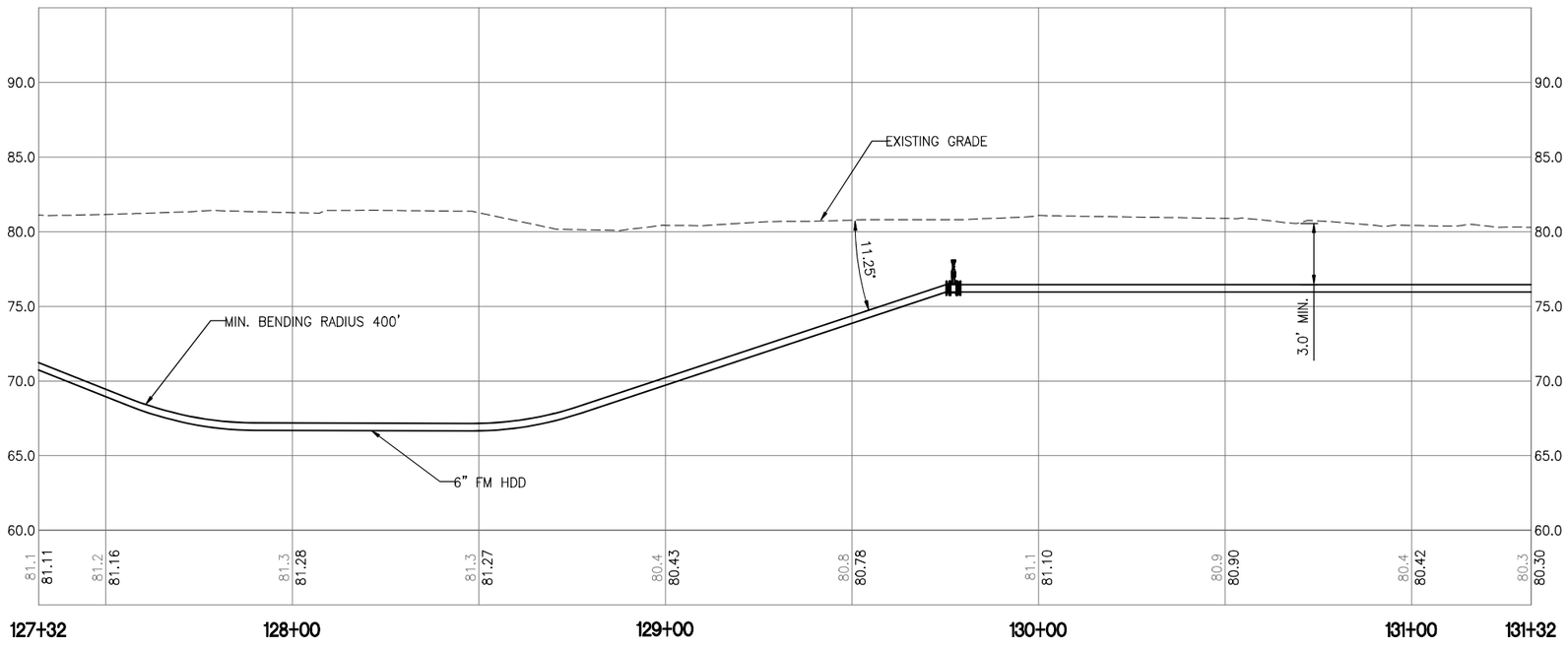
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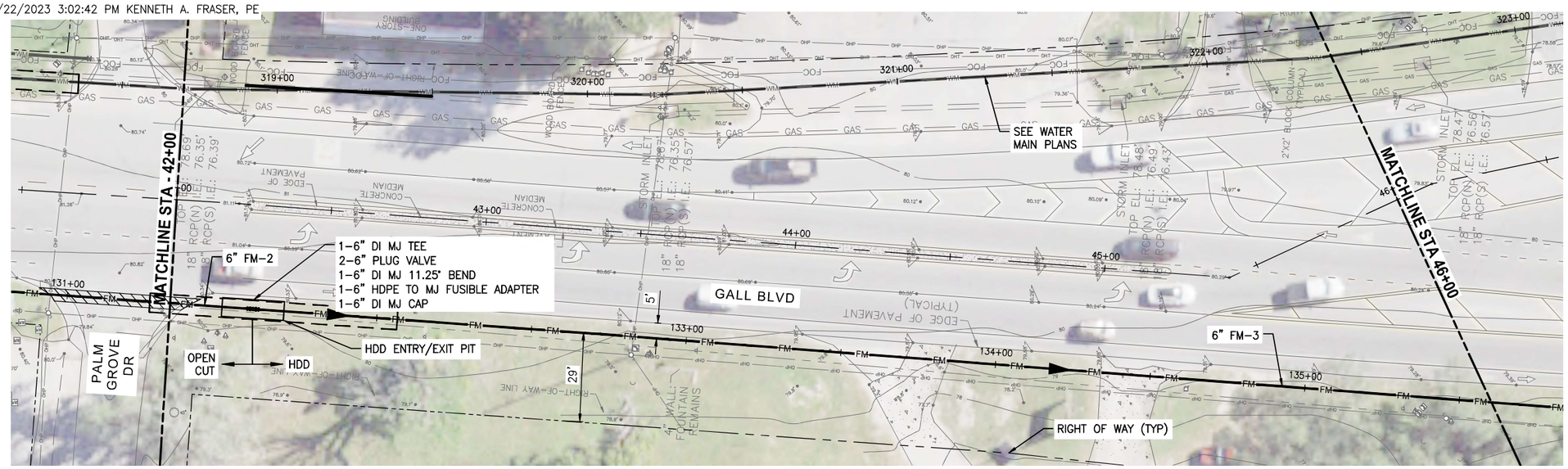
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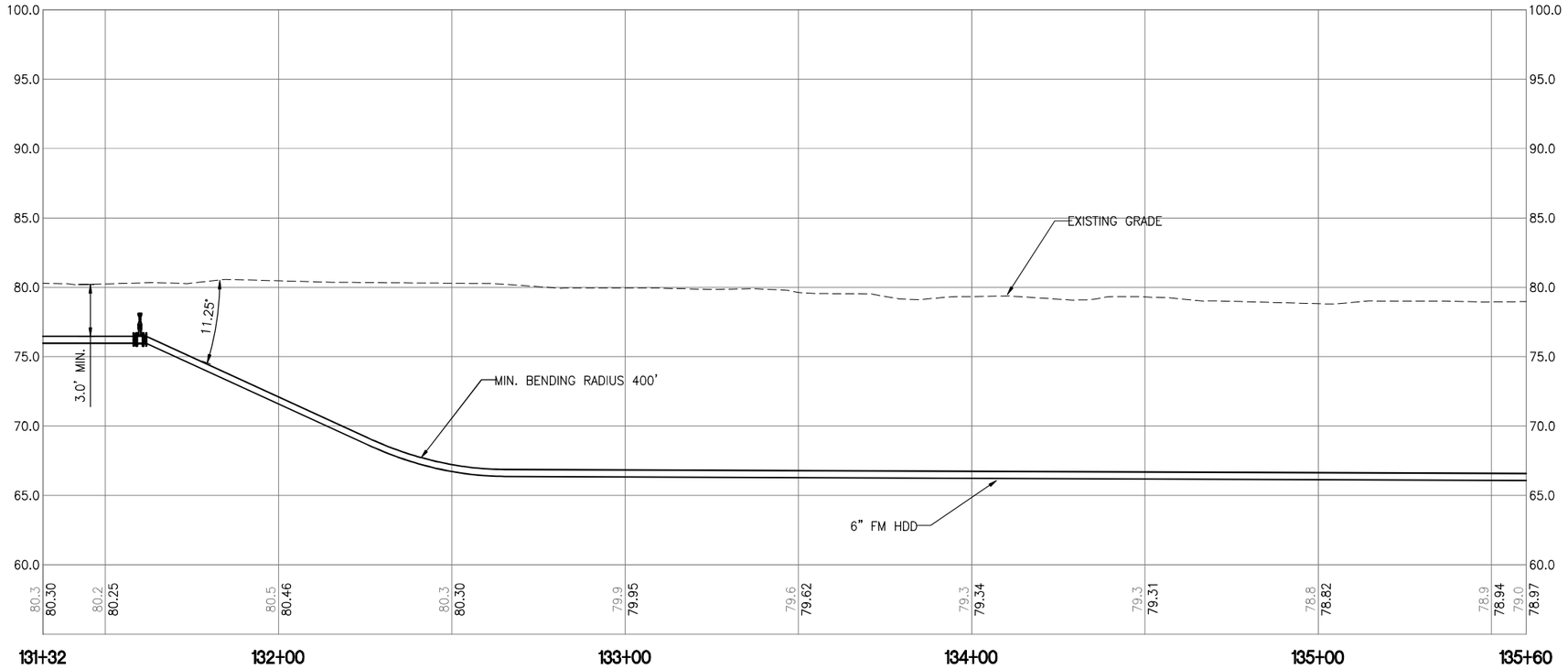
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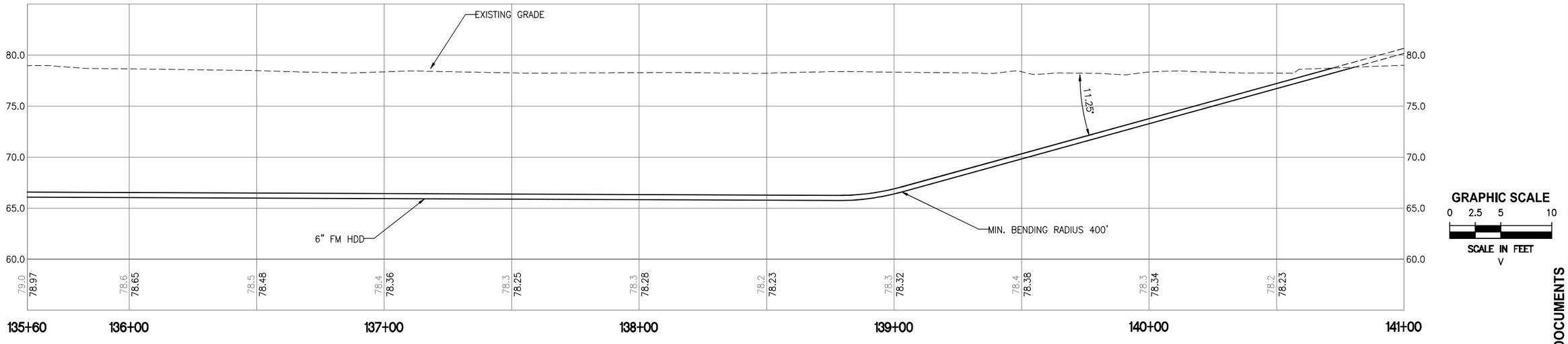
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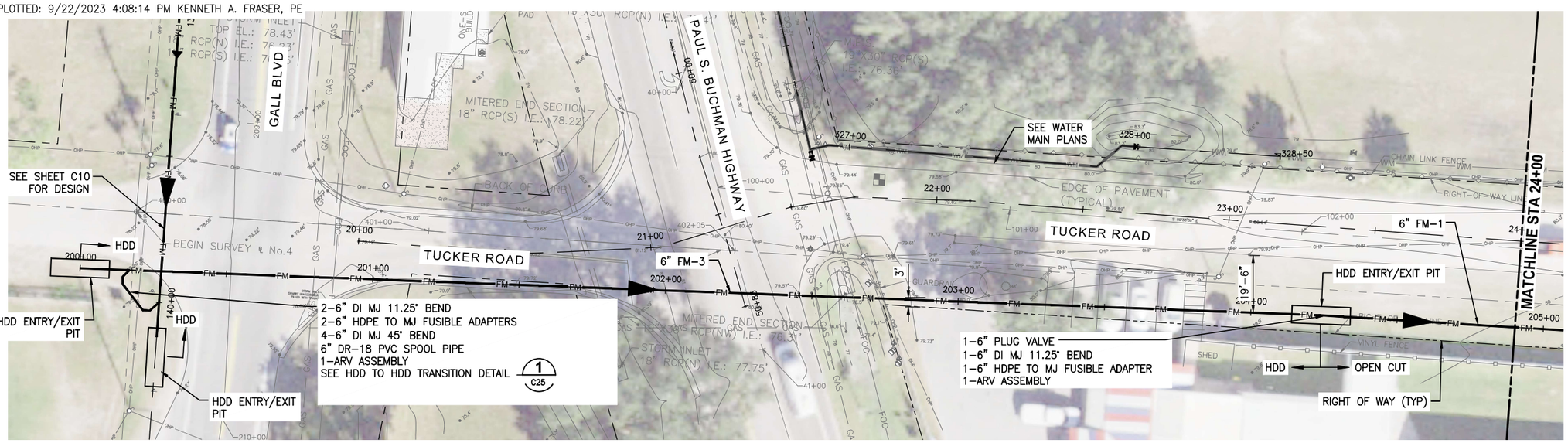
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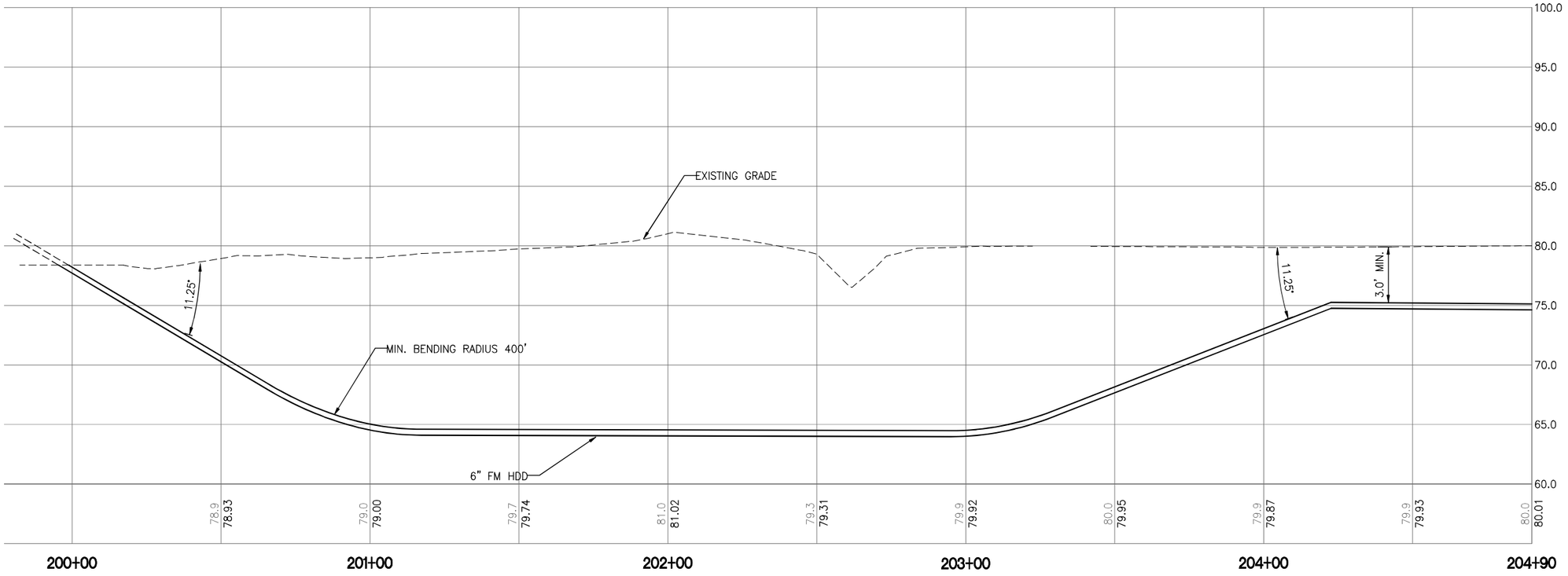
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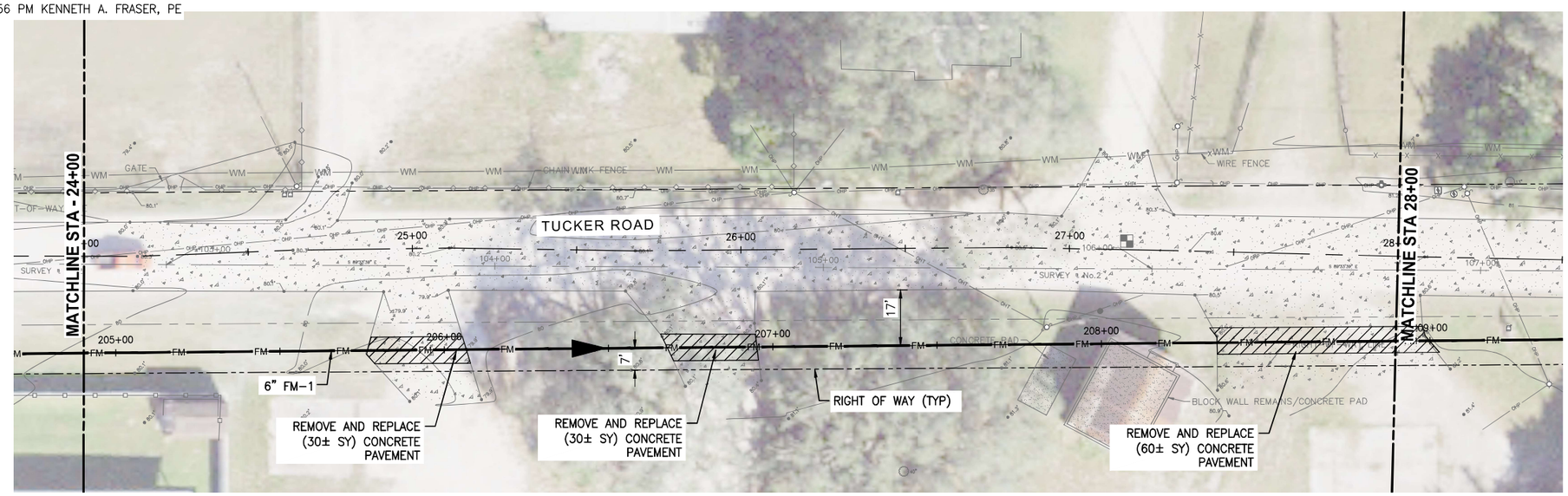
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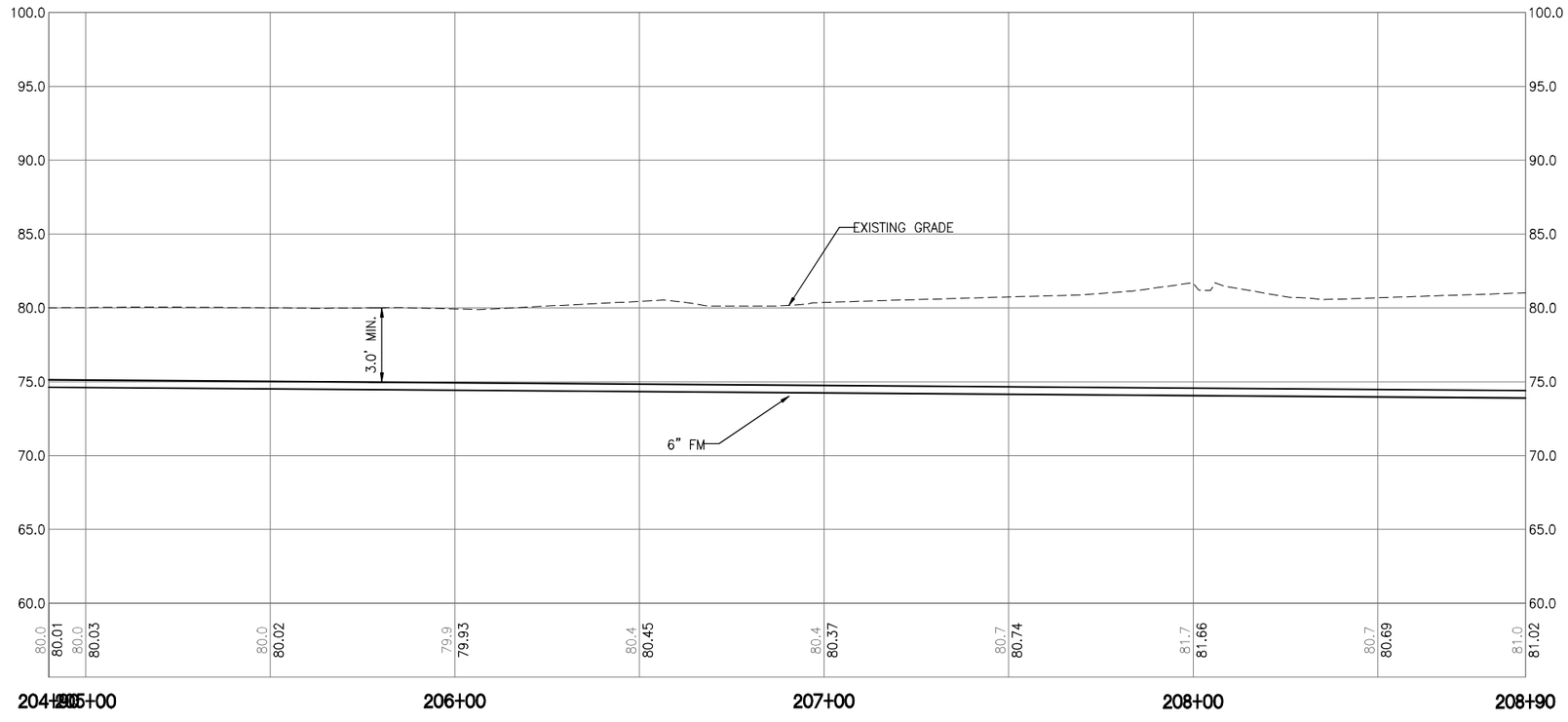
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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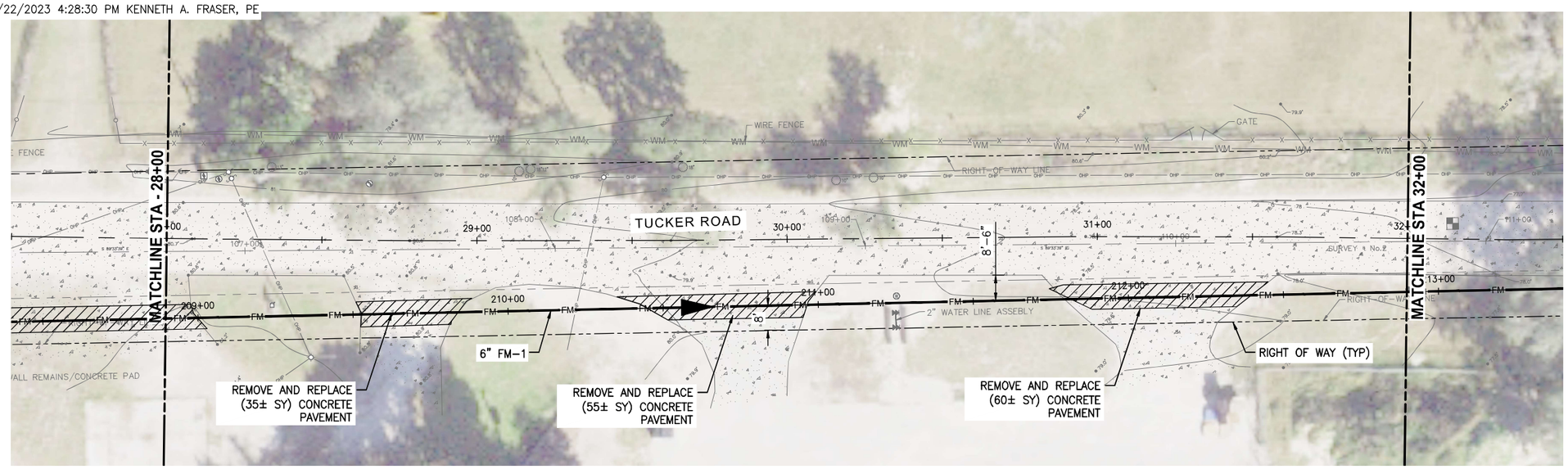
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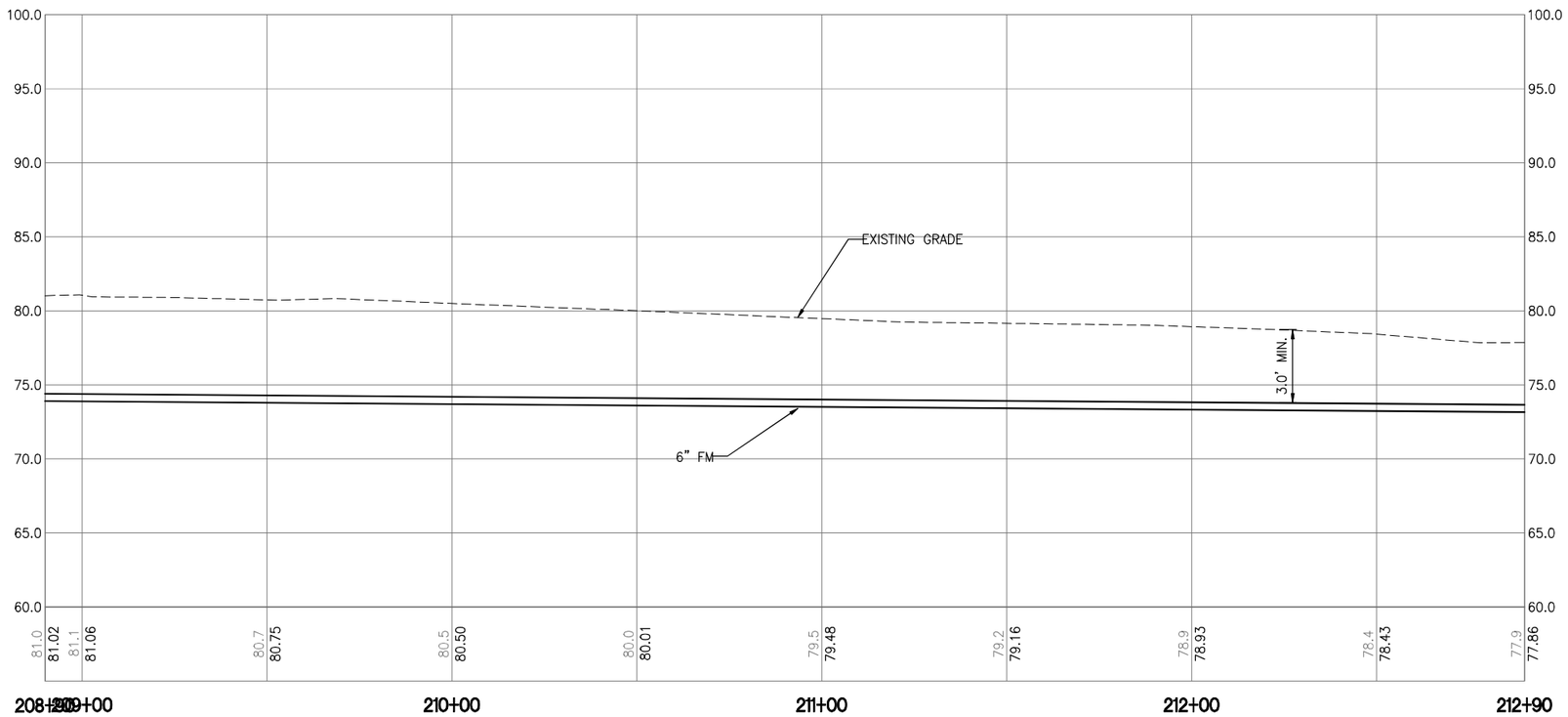
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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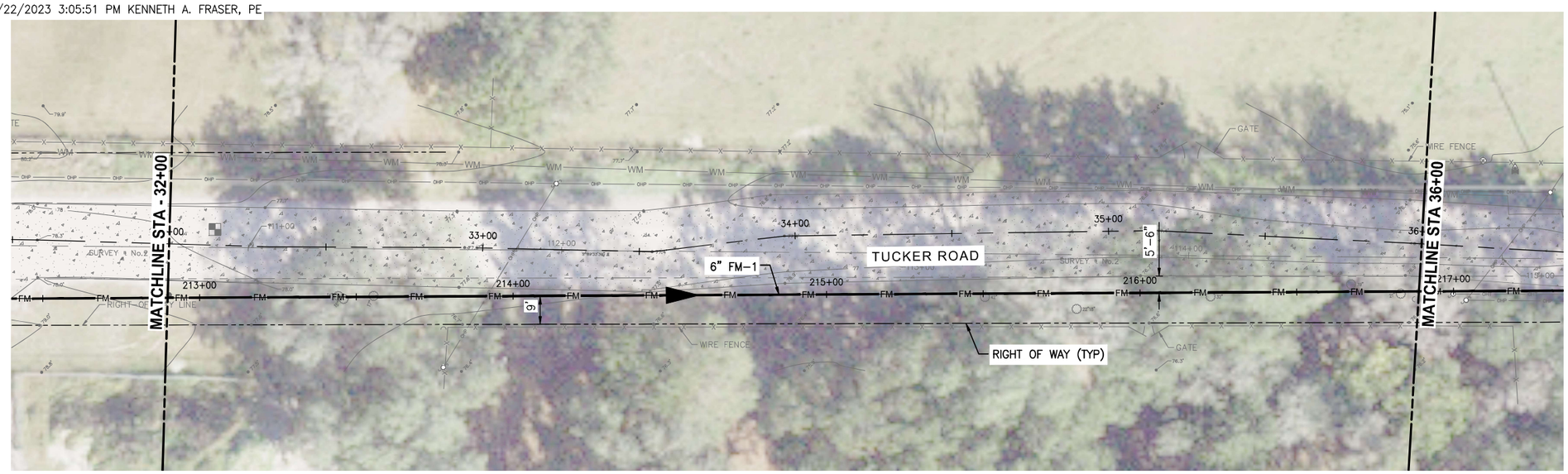
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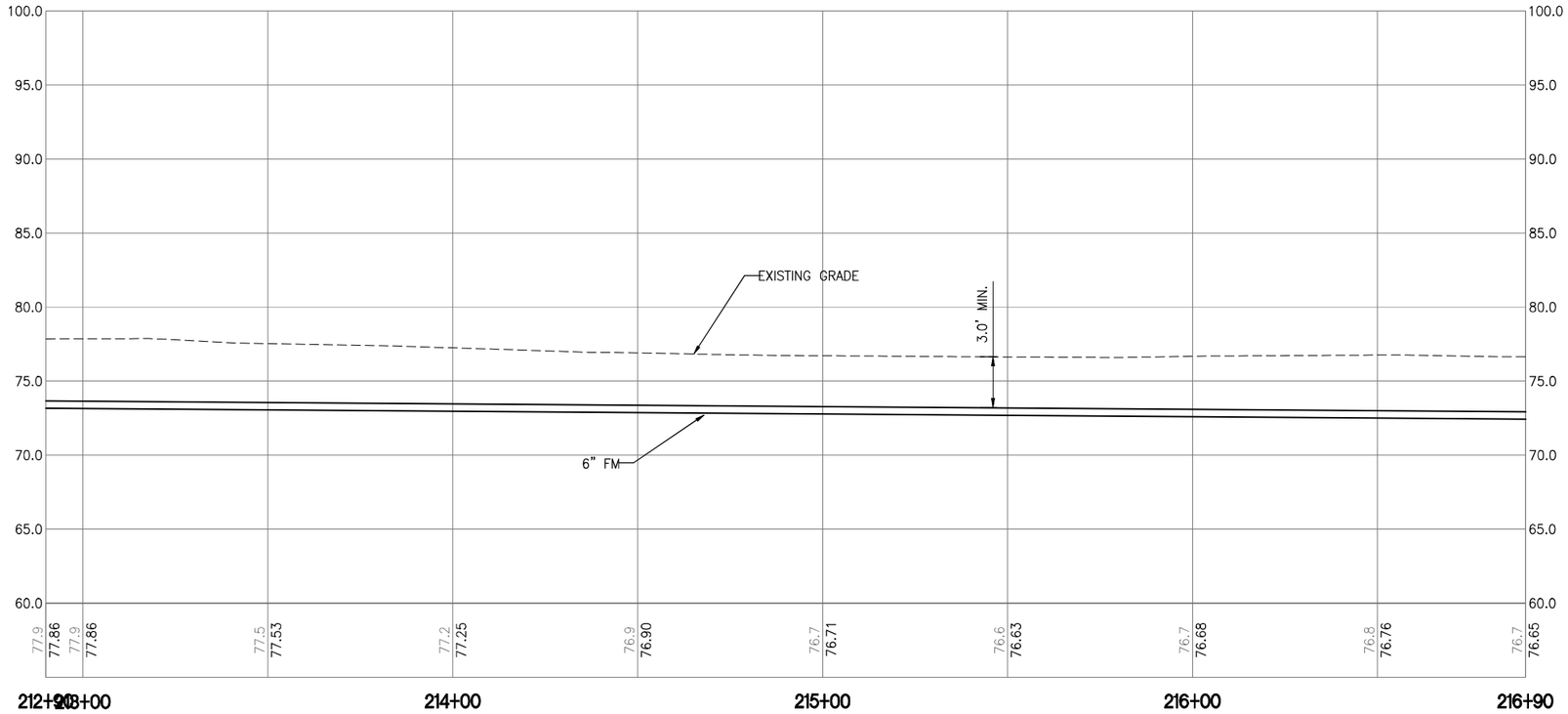
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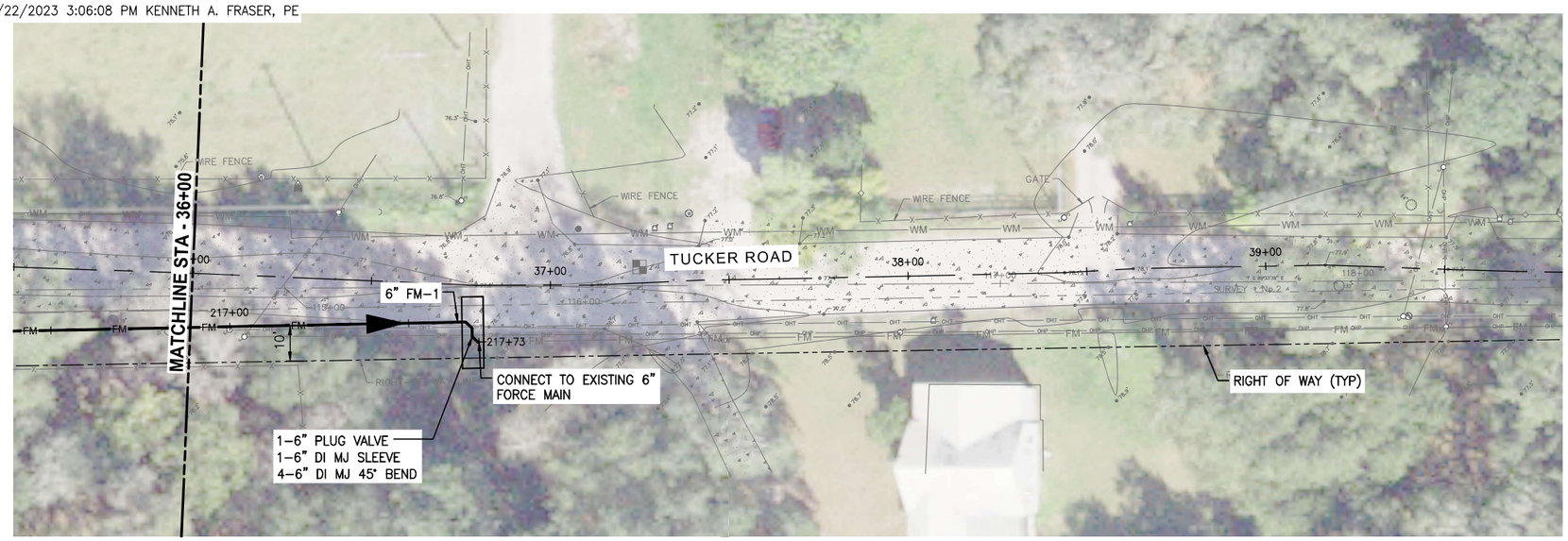
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DWG NO: C14

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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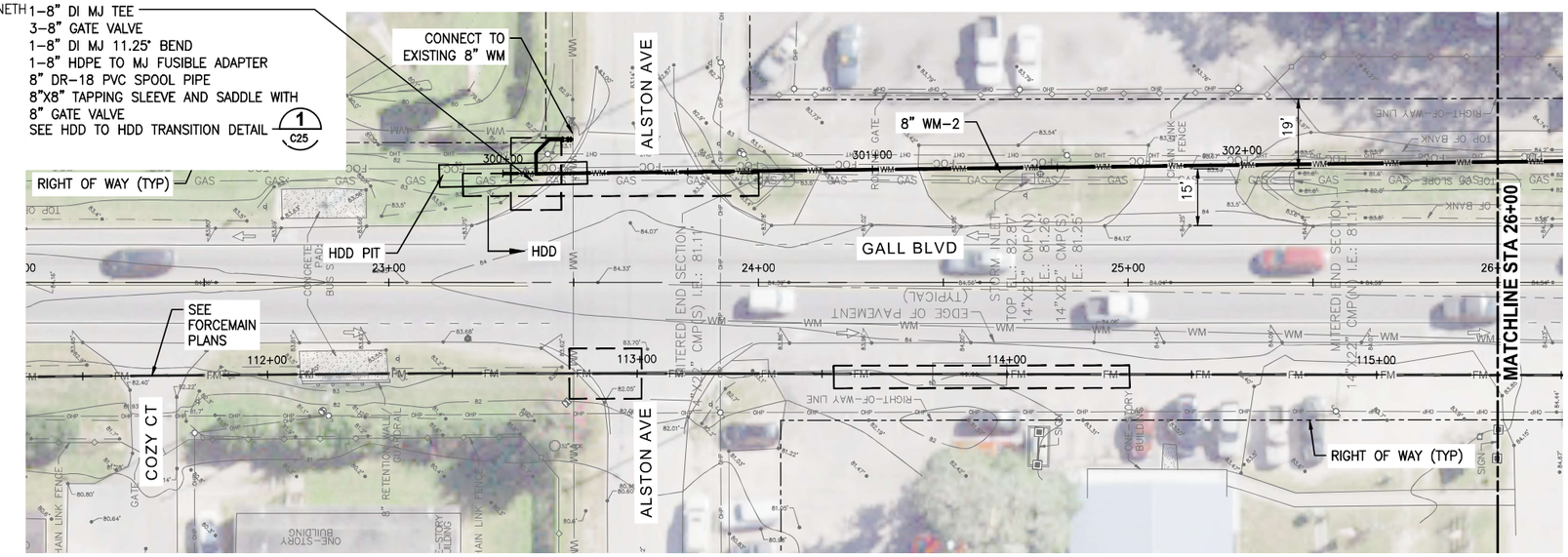
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1–8" DI MJ TEE
3–8" GATE VALVE
1–8" DI MJ 11.25° BEND
1–8" HDPE TO MJ FUSIBLE ADAPTER
8" DR–18 PVC SPOOL PIPE
8"X8" TAPPING SLEEVE AND SADDLE WITH 8" GATE VALVE
SEE HDD TO HDD TRANSITION DETAIL (1 / C25)



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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

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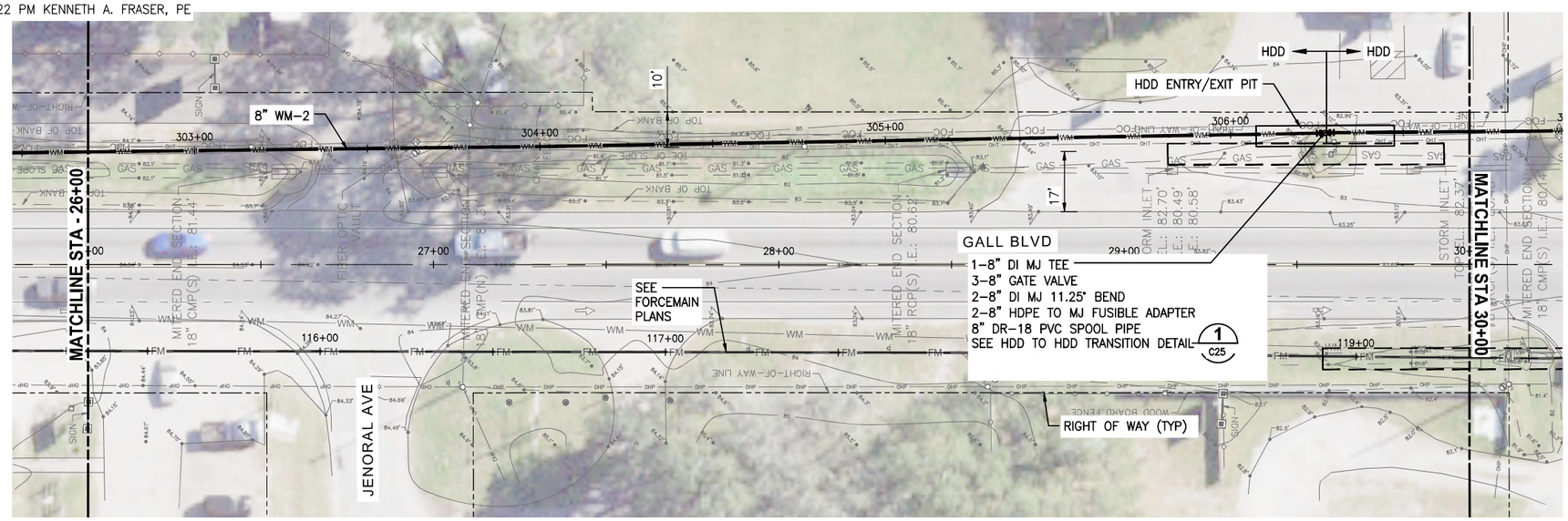
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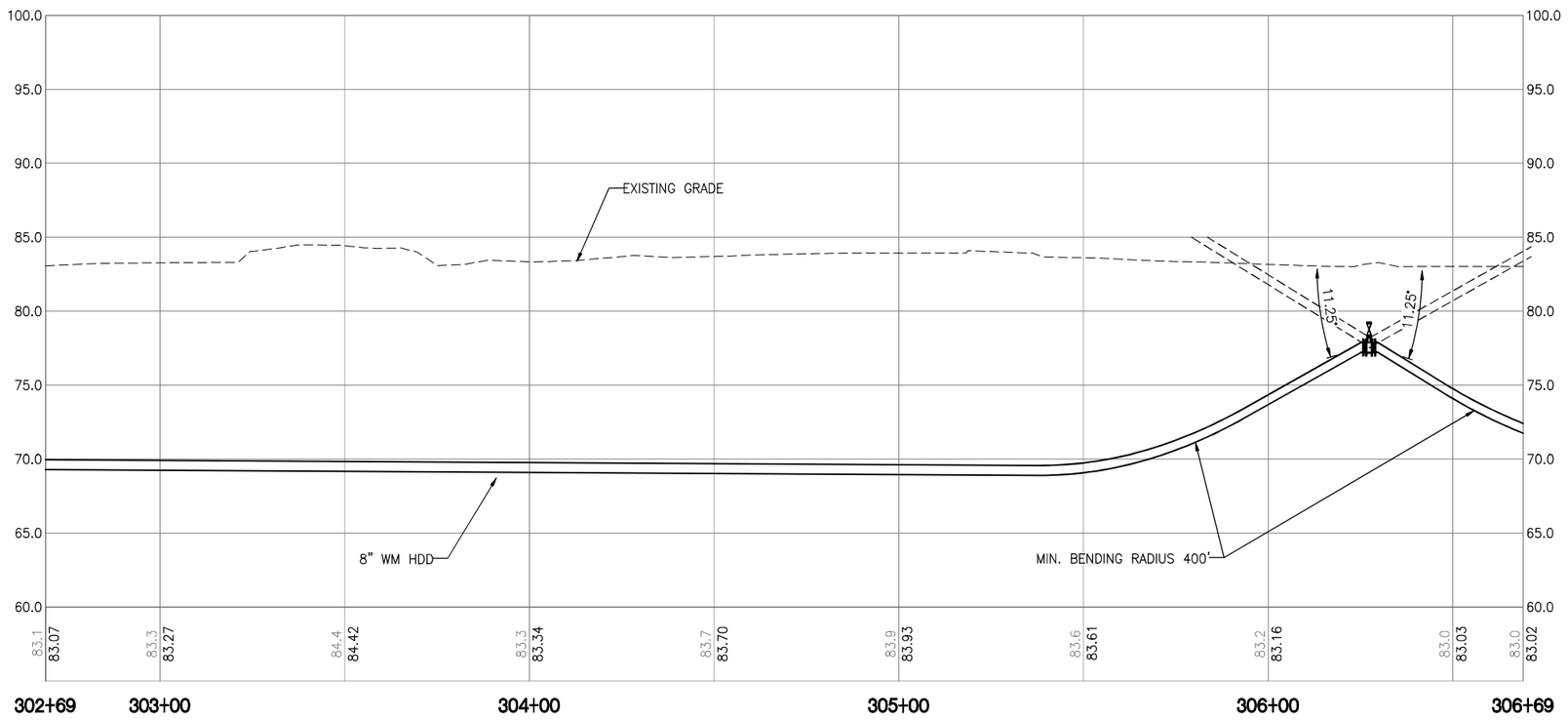
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DATE: SEPT 2023
INDEX NO:
DWG NO: C16

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

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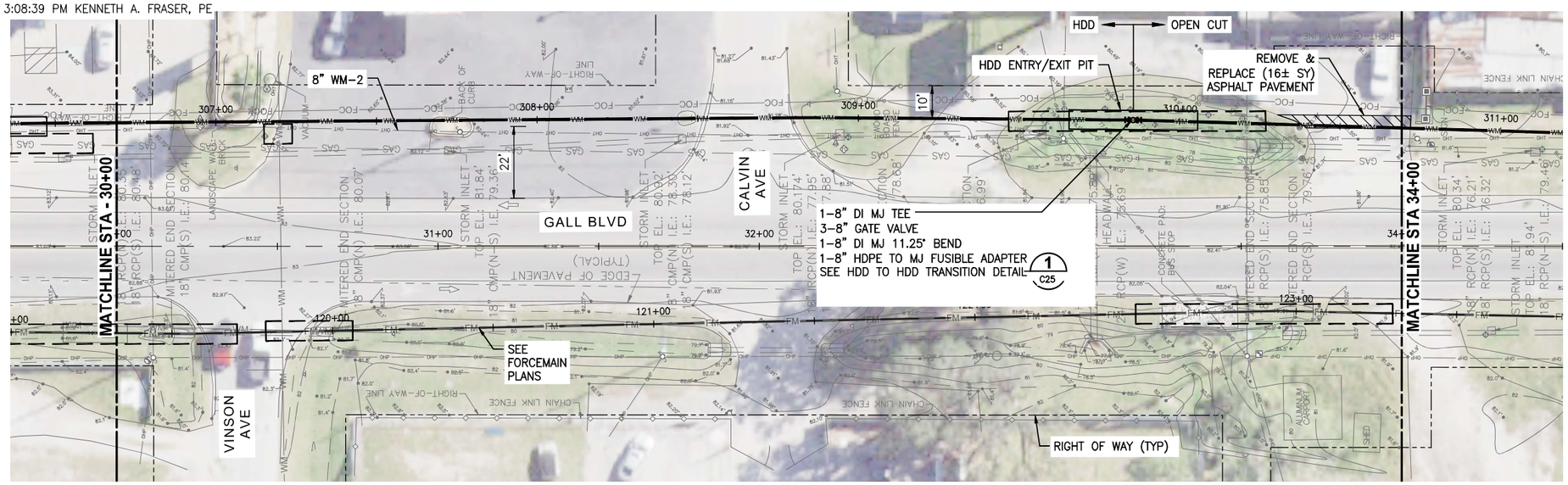
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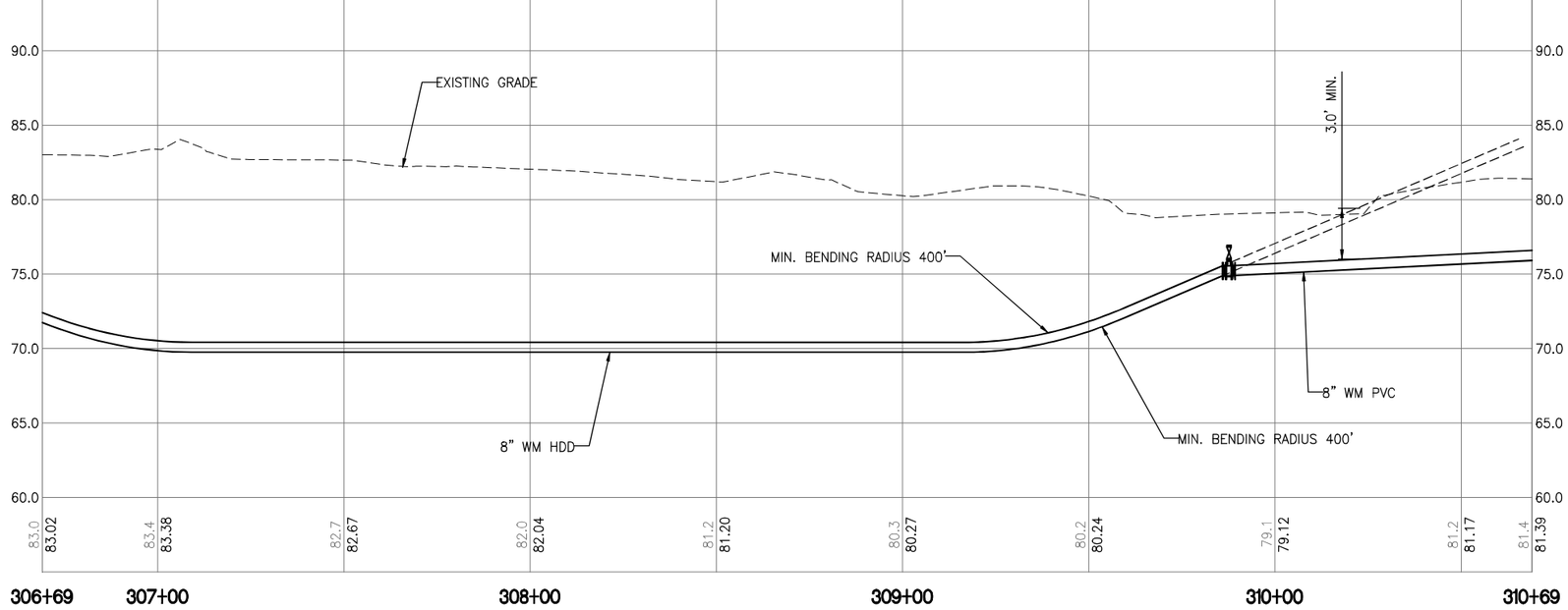
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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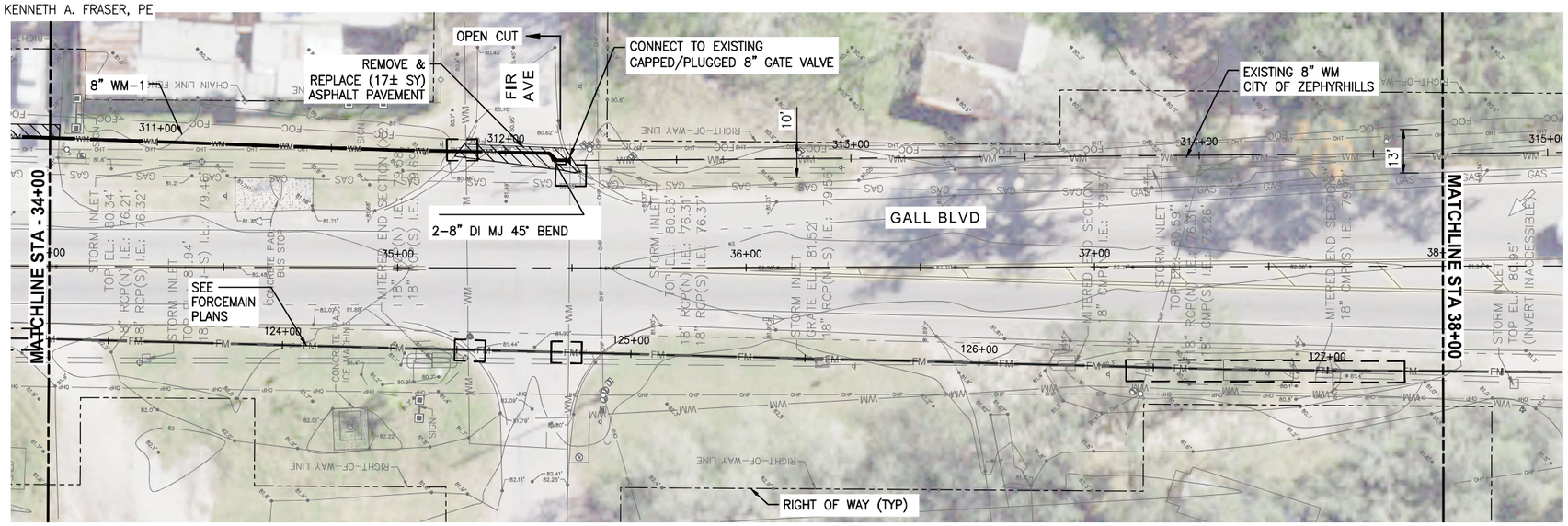
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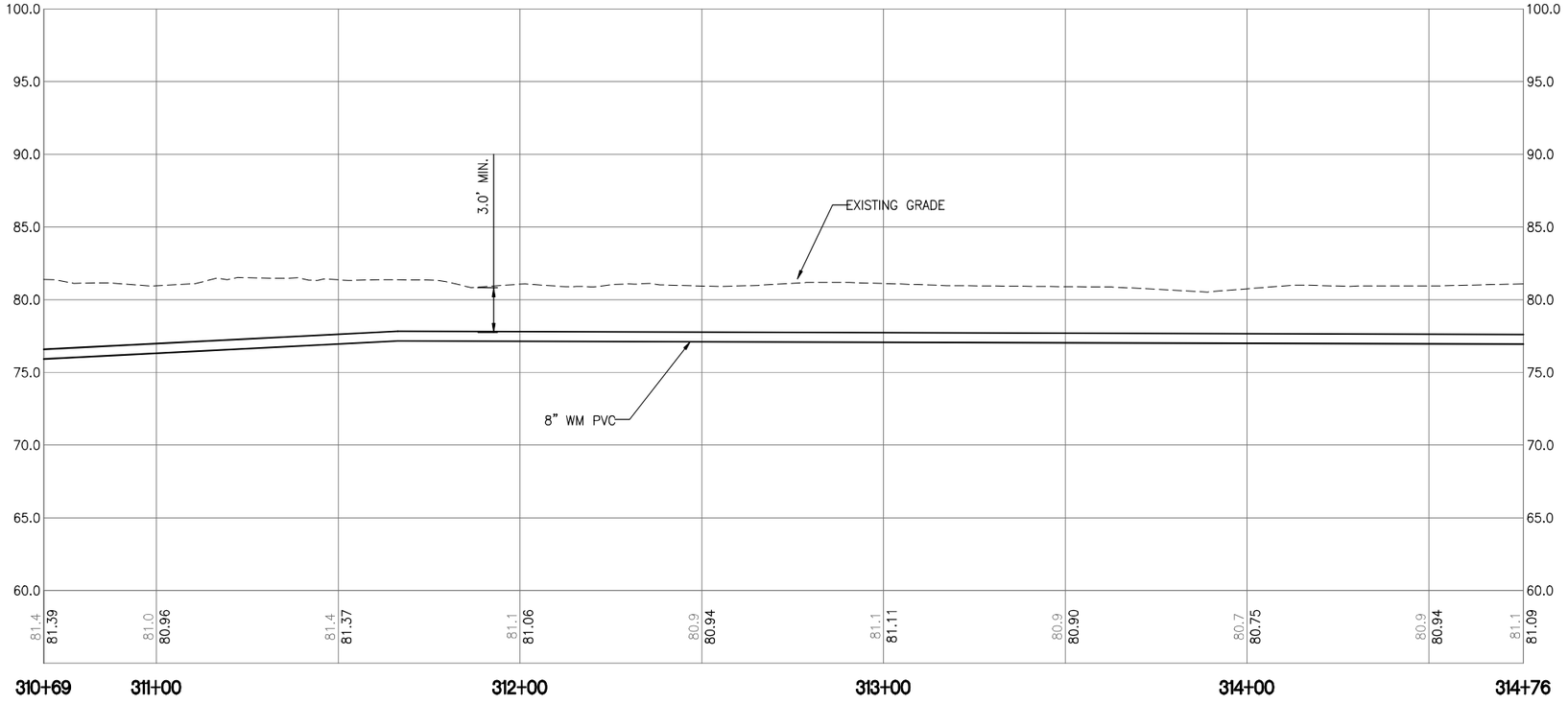
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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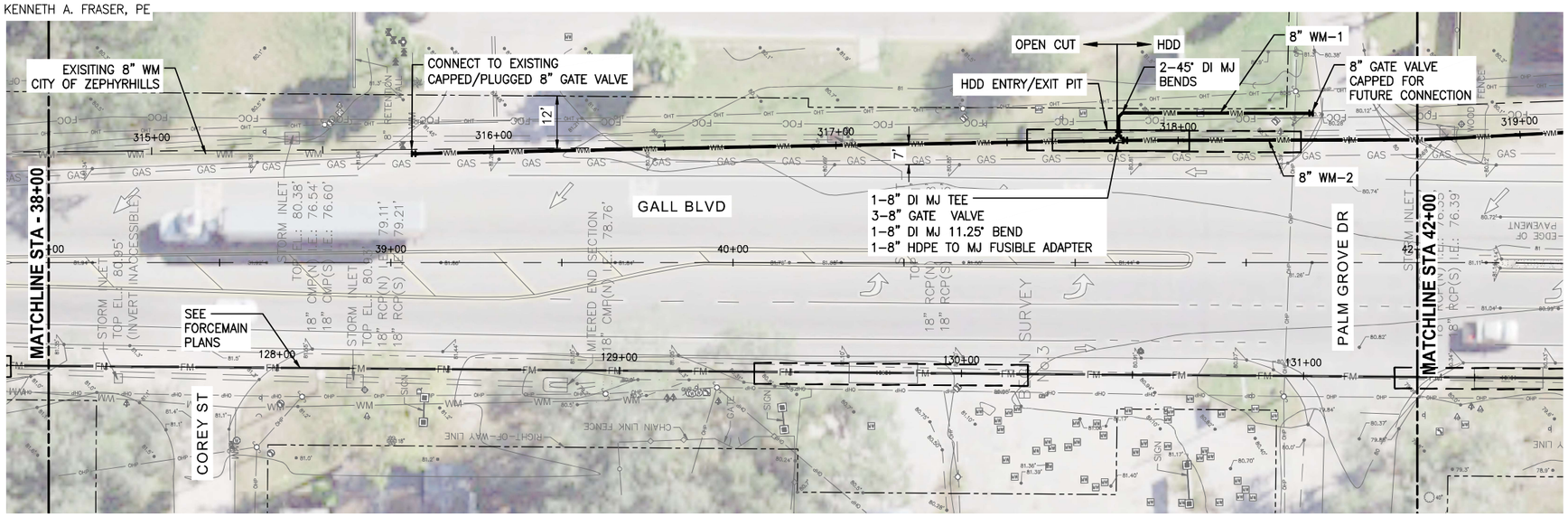
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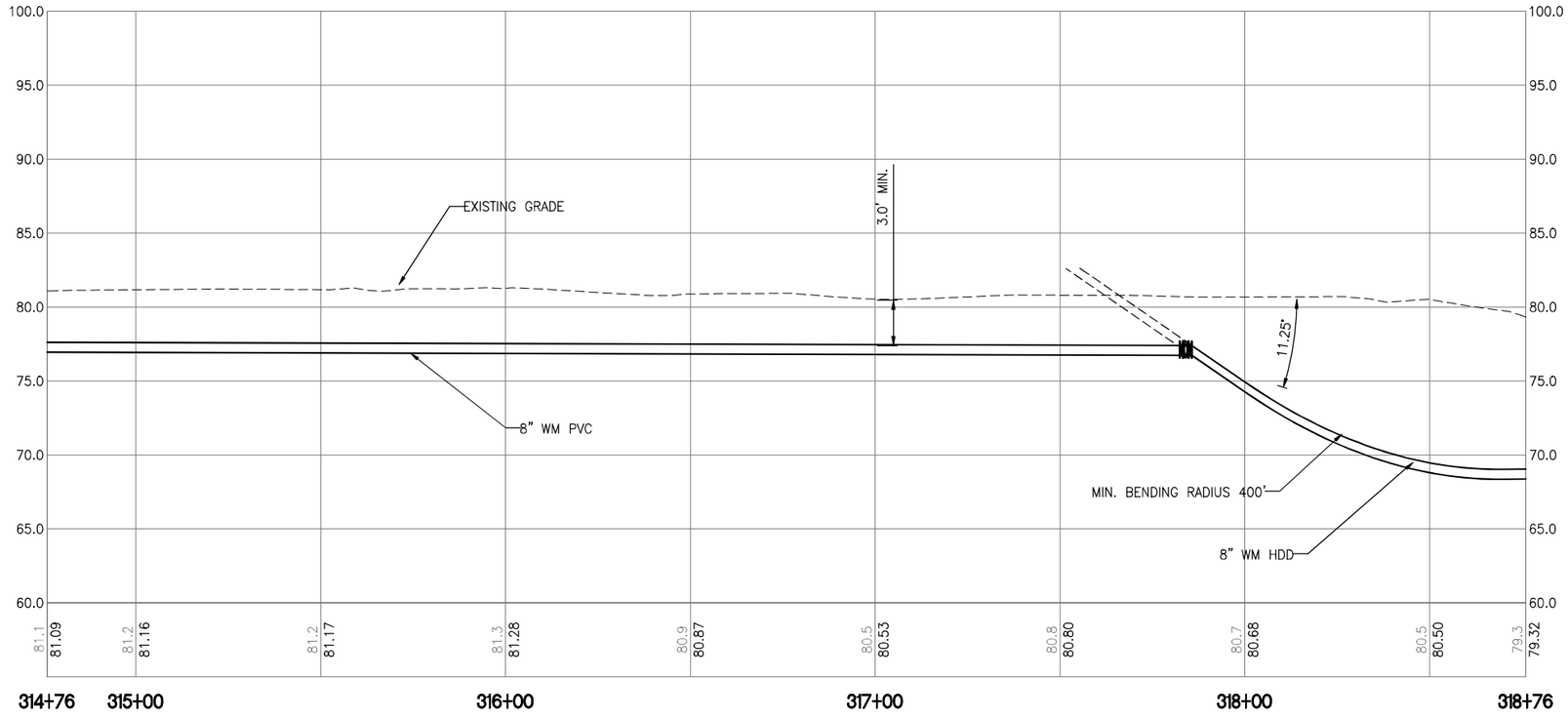
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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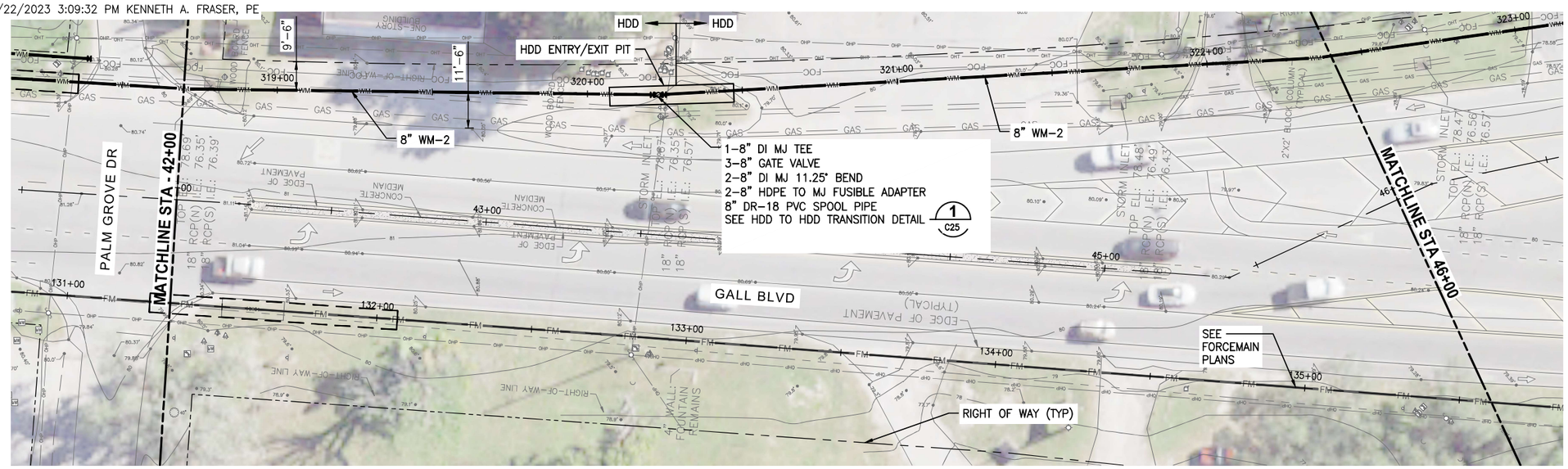
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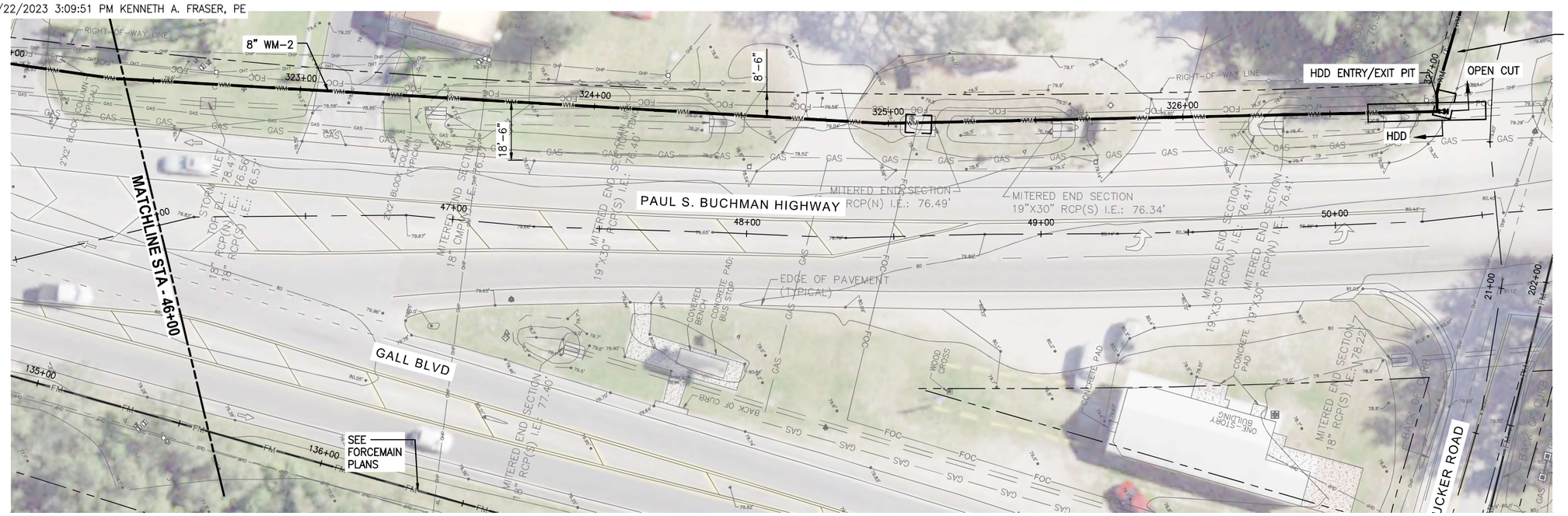
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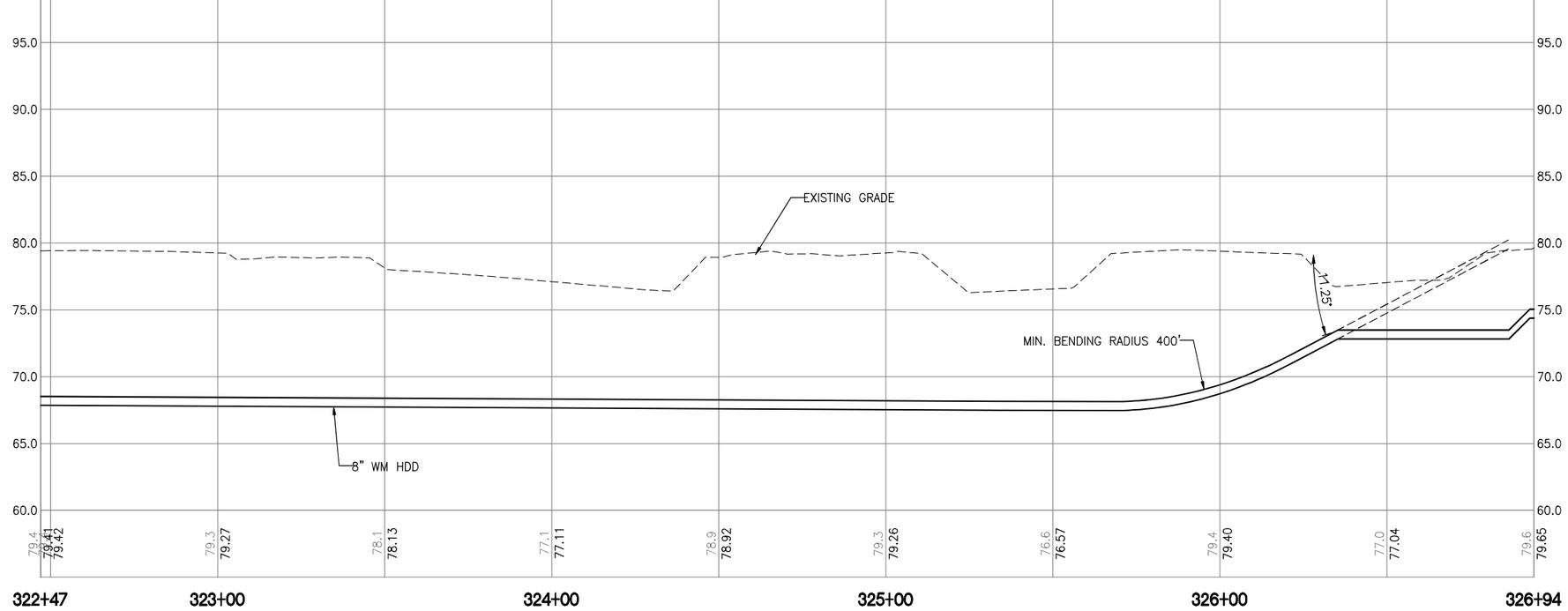
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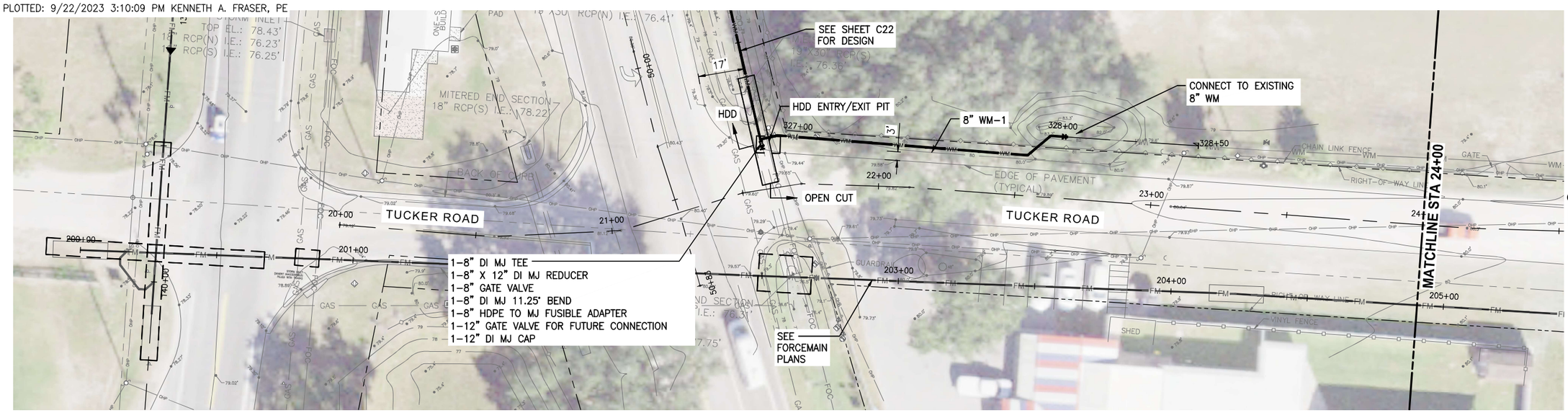
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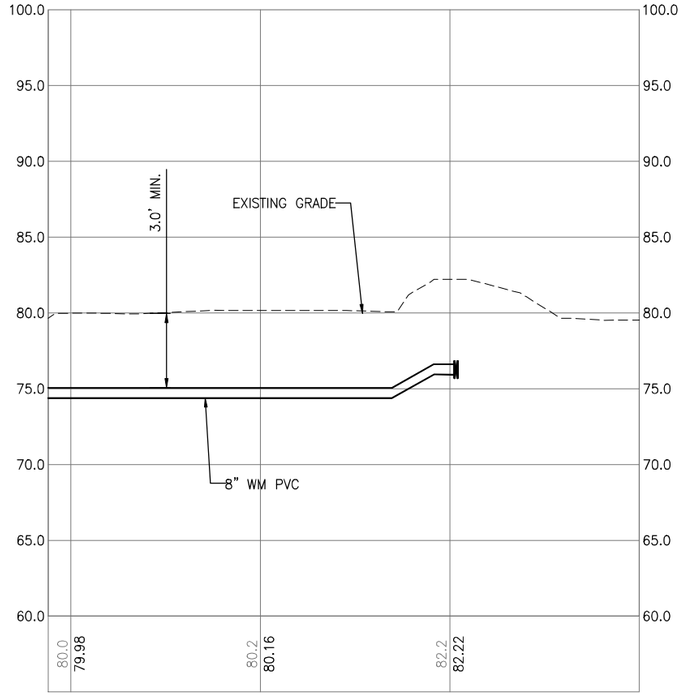
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SAVED: 9/22/2023 1:23 PM KFRASER Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\051-01 SOUTH 301 W-WW PIPELINES\DESIGN&CONSTRUCTION\CAD\DWGS\CIVIL\2611005101-C16.DWG

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

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730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

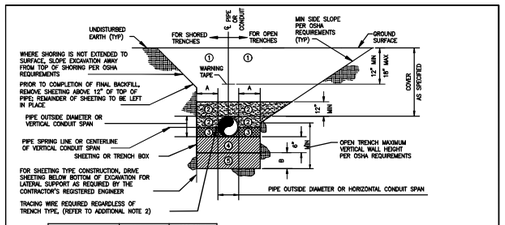
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PROJECT NO: 26110-051-01
DATE: SEPT 2023
INDEX NO:
DWG NO: C23

Approved
2023-H-3003-00197
James A. Meyer
11/6/2023

PLOTTED: 9/22/2023 3:10:22 PM KENNETH A. FRASER, PE
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NOMINAL PIPE DIAMETER OR HORIZONTAL CONDUIT SPAN (INCHES)	MINIMUM SIDEWALL CLEARANCE A (INCHES)	ADDITIONAL EXCAVATION DEPTH (1) B (INCHES)
LESS THAN 24	12	12
24 AND GREATER	18	18

(1) REQUIRED WHERE UNSUITABLE MATERIAL IS ENCOUNTERED.

ZONE NO.	ZONE NAME	MATERIAL	COMPACTION
1	FINAL BACKFILL	AS SPECIFIED	AT LEAST 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY ASTM D-1557 (98% WHEN UNDER PAVEMENT)
2	INITIAL BACKFILL		
3	HAUNCHING		
4	BEDDING		
5	FOUNDATION		

TRENCH ZONE NOTES:

(1) FINAL BACKFILL SHALL BE INSTALLED IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. REFER TO ADDITIONAL NOTE 3.

(2) INITIAL BACKFILL SHALL BE INSTALLED IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HAND TAMPING OR AN APPROVED METHOD OF MECHANICAL TAMPING. REFER TO ADDITIONAL NOTE 3.

(3) HAUNCHING SHALL BE IN COMPLETELY DEWATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HAND TAMPING. HAUNCHING SHALL BE BROUGHT UP EQUALLY ON BOTH SIDES OF THE PIPE.

(4) BEDDING SHALL BE INSTALLED IN COMPLETELY DEWATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT, AND SHALL BE COMPACTED BY HAND OR MECHANICAL TAMPING. PROPERLY SHAPED BELL HOLES SHALL BE EXCAVATED IN THE BEDDING TO PERMIT ASSEMBLY OF THE PIPE. REFER TO ADDITIONAL NOTE 3.

(5) NATIVE, UNDISTURBED MATERIAL IN COMPLETELY DEWATERED TRENCHES MEETING THE COMPACTION AND MATERIAL REQUIREMENTS FOR COMPACTED BEDDING MATERIAL NEED NOT BE REPLACED OR REWORKED, EXCEPT FOR SHAPING OF THE BELL HOLES, AND WHERE REFILL IS REQUIRED.

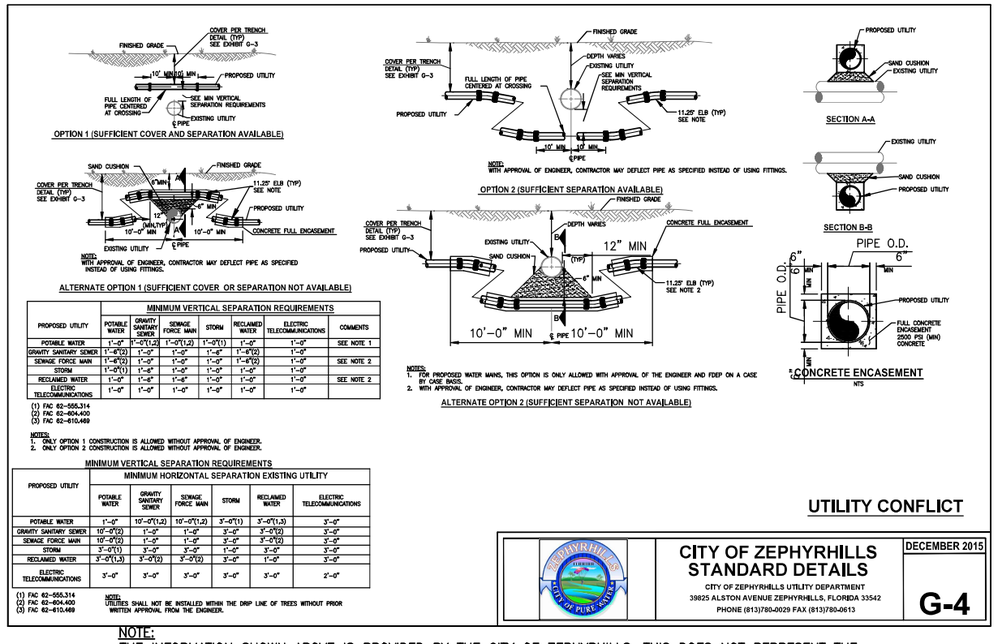
FOUNDATION SHALL BE REQUIRED WHERE UNSUITABLE MATERIAL IS ENCOUNTERED. FOUNDATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS FOR BEDDING. REFER TO ADDITIONAL NOTE 3.

ADDITIONAL NOTES:

1. FOR TRENCHES IN VEHICULAR TRAFFIC AREAS OR BENEATH SURFACE IMPROVEMENTS (CG, SLABS, ASPHALT, ETC.) SEE CONTRACT SPECIFICATIONS FOR ADDITIONAL COMPACTION REQUIREMENTS. SEE DRAWINGS FOR SURFACE IMPROVEMENT AND /OR RESTORATION DETAILS WHERE APPLICABLE.
2. TRACING WIRE SHALL BE INSTALLED ON THE SIDE OF THE PIPE AND ATTACHED TO THE PIPE EVERY 10' W/ A NYLON WIRE TIE. IF THE WIRE IS DAMAGED OR NEEDS TO BE EXTENDED A 3M WATERPROOF TYPE UF SPLICE SHALL BE INSTALLED TO REPAIR THE WIRE. THE ENDS OF THE TRACING WIRE SHALL BE BROUGHT UP IN EVERY VALVE BOX ON THE LINE AND AT THE HYDRANT VALVES. THERE SHALL BE A MINIMUM COIL OF 3' LEFT UNDER THE VALVE BOX COVER. THE WIRE SHALL BE TESTED TO VERIFY CONDUCTIVITY.
3. ALTERNATIVE LIFT THICKNESSES, NOT EXCEEDING 12 INCHES LOOSE MEASUREMENT, ARE ACCEPTABLE IN TRENCH ZONES 1, 2, 4, AND 5 PROVIDED 1) THE LIFT THICKNESS DOES NOT EXCEED THE MAXIMUM VALUE RECOMMENDED IN WRITING BY THE APPLICABLE PIPE MANUFACTURER AND 2) FIELD TEST RESULTS CONFIRM THAT THE SPECIFIED COMPACTION REQUIREMENTS ARE BEING MET.

TYPICAL UTILITY TRENCH DETAIL
NTS

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613
DECEMBER 2015
G-3



PROPOSED UTILITY	MINIMUM VERTICAL SEPARATION REQUIREMENTS						
	POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS	COMMENTS
POTABLE WATER	1'-0"	1'-0"(1,2)	1'-0"(1,2)	1'-0"(1)	1'-0"	1'-0"	SEE NOTE 1
GRAVITY SANITARY SEWER	1'-6"(2)	1'-0"	1'-0"	1'-0"	1'-0"(2)	1'-0"	
SEWAGE FORCE MAIN	1'-6"(2)	1'-0"	1'-0"	1'-0"	1'-6"(2)	1'-0"	SEE NOTE 2
STORM	1'-0"(1)	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	
RECLAIMED WATER	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	SEE NOTE 2
ELECTRIC TELECOMMUNICATIONS	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	

(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

NOTES:
1. ONLY OPTION 1 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.
2. ONLY OPTION 2 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.

NOTES:
1. FOR PROPOSED WATER MAINS, THIS OPTION IS ONLY ALLOWED WITH APPROVAL OF THE ENGINEER AND FDEP ON A CASE BY CASE BASIS.
2. WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

MINIMUM VERTICAL SEPARATION REQUIREMENTS

PROPOSED UTILITY	MINIMUM HORIZONTAL SEPARATION EXISTING UTILITY					
	POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS
POTABLE WATER	1'-0"	10'-0"(1,2)	10'-0"(1,2)	3'-0"(1)	3'-0"(1)	3'-0"
GRAVITY SANITARY SEWER	10'-0"(2)	1'-0"	1'-0"	3'-0"	3'-0"(2)	3'-0"
SEWAGE FORCE MAIN	10'-0"(2)	1'-0"	1'-0"	3'-0"	3'-0"(2)	3'-0"
STORM	3'-0"(1)	3'-0"	3'-0"	1'-0"	3'-0"	3'-0"
RECLAIMED WATER	3'-0"(1,3)	3'-0"(2)	3'-0"(2)	3'-0"	1'-0"	3'-0"
ELECTRIC TELECOMMUNICATIONS	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	2'-0"

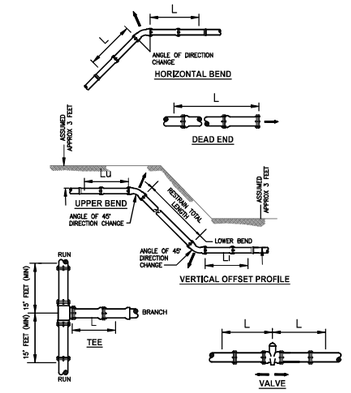
(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

NOTE:
UTILITIES SHALL NOT BE INSTALLED WITHIN THE DRIP LINE OF TREES WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.

UTILITY CONFLICT

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CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
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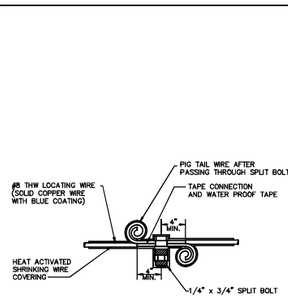
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NOMINAL SIZE	VALVES OR DEAD-ENDS	HORIZONTAL BENDS 90° BENDS	45° BENDS	22.5° BENDS	11.25° BENDS	VERTICAL OFFSET Lu	Ll	TEES RUN SIZE	BRANCH SIZE	L (FT)	REDUCERS RUN SIZE	L (FT)
10	84	37	16	85	4	35	16	10	≤10	27	12 TO 10	29
12	99	43	18	9	5	41	18	12	≤12	41		

NOTES:
1. THE SCHEDULE SHOWN IS FOR THE FOLLOWING SERVICE CONDITIONS: 150 PSIG; SPECIFIED TRENCH ZONE MATERIAL; 36 INCHES COVER; TYPE 3 LAYING CONDITIONS; AND 1.5 SAFETY FACTOR.
2. RESTRAINED LENGTHS SHOWN IN TABLE ARE IN FEET AND ARE MINIMUM LENGTHS REQUIRED IN EACH DIRECTION FROM FITTING OR VALVES.
3. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING RESTRAINED JOINTS.
4. ALL PIPE SHALL BE RESTRAINED TO THE NEXT JOINT BEYOND THE RESTRAINED LENGTH GIVEN.
5. EACH SIDE OF HDPE TRANSITION FITTINGS SHALL BE RESTRAINED PER THE RESTRAINED JOINT SCHEDULE AS AN IN-LINE VALVE.

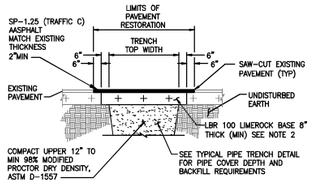
TYPICAL RESTRAINED JOINT DETAIL
NTS



NOTES:
1. THE ENDS OF ALL LOCATING WIRES, WHETHER THEY ARE SPLICED, CONNECTED, OR TERMINATED, SHALL HAVE THE LAST THREE INCHES PIG TAILED AS DETAILED HEREON.
2. AFTER INSTALLATION OF THE LOCATING WIRE THE SYSTEM SHALL BE SUBJECTED TO TESTING, IN THE PRESENCE OF CITY UTILITIES STAFF PRIOR TO BACKFILL, IN ORDER TO THAT THE SYSTEM IS FUNCTIONAL.

LOCATING WIRE SPLICING
NOT TO SCALE

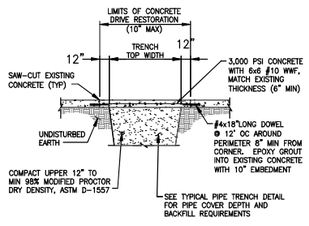
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G-8



NOTES:
1. ASPHALT PAVEMENT RESTORATION DETAIL APPLIES TO CITY ROADS, DRIVEWAYS, PRIVATE ROADS, DRIVES, MISCELLANEOUS PATCHES, AND SIMILAR RESTORATION.
2. NEW LIMEROCK TO BE COMPACTED TO NOT LESS THAN 98% MODIFIED PROCTOR DRY DENSITY, ASTMD-1557.
3. FOR COUNTY ROADS AND STATE ROADS, DESIGN SHALL BE IN COMPLIANCE WITH PASCO COUNTY STANDARDS AND FDOT STANDARDS RESPECTFULLY.

ASPHALT PAVEMENT RESTORATION
NTS

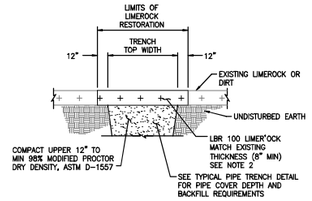
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NOTES:
MATCH EXISTING GRADE AND FINISH.

CONCRETE DRIVE RESTORATION
NTS

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DECEMBER 2015
G-9A



NOTES:
1. LIMEROCK PAVEMENT RESTORATION DETAIL APPLIES TO COUNTY ROADS, DRIVEWAYS, PRIVATE ROADS, DRIVES, MISCELLANEOUS PATCHES, AND SIMILAR RESTORATION.
2. NEW LIMEROCK TO BE COMPACTED TO NOT LESS THAN 98% MODIFIED PROCTOR DRY DENSITY, ASTMD-1557.

LIMEROCK RESTORATION
NTS

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

CIVIL DETAILS

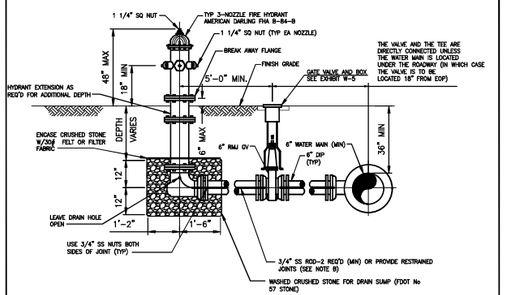
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PROJECT NO: 26110-051-01
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Approved 2023-H-03-00197 James A. Mayer 11/6/2023

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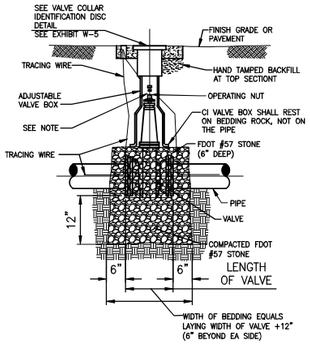
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NOTES:
A. FIRE HYDRANT INSTALLATION SHALL BE IN ACCORDANCE WITH THE CITY'S LAND DEVELOPMENT CODE.
B. 3/4" STAINLESS STEEL ROD CUT AND THREADED AS REQUIRED, OR PROVIDE RESTRAINED JOINTS.
C. FIRE HYDRANTS SHALL BE INSTALLED BETWEEN 3' AND 7' FROM EDGE OF PAVEMENT.
D. TIE RODS, NUTS, WASHERS AND OTHER FASTENERS SHALL BE GALVANIZED OR TYPE 316 STAINLESS STEEL.
E. 4 1/2" PUMPER NOZZLE TO BE PERPENDICULAR TO CENTERLINE OF MAJOR STREET.
F. FIRE HYDRANT ASSEMBLY INCLUDES ALL THAT IS SHOWN INCLUDING DI PIPE TO R/W, DIP TEE AT MAIN, HYDRANT, REDUCERS, VALVE, HYDRANT EXTENSIONS, VALVE EXTENSIONS, ALL PIPING AND MISCELLANEOUS APPURTENANCES REQUIRED FOR A COMPLETE INSTALLATION.
G. FOR FIRE HYDRANTS ALONG PAVED ROADWAYS, INSTALL RAISED PAVEMENT MARKER FOR FIRE HYDRANT IDENTIFICATION. MARKER SHALL BE BLUE AND IN ACCORDANCE WITH FDOT 706. MARKER SHALL BE LOCATED IN THE CENTER OF CLOSEST LANE PERPENDICULAR TO FIRE HYDRANT.

FIRE HYDRANT DETAIL
NTS

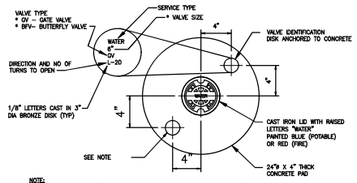
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APRIL 2020
W-10



NOTES:
1. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.
2. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.

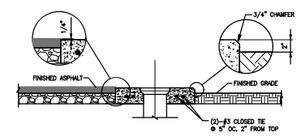
GATE VALVE BOX
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W-3



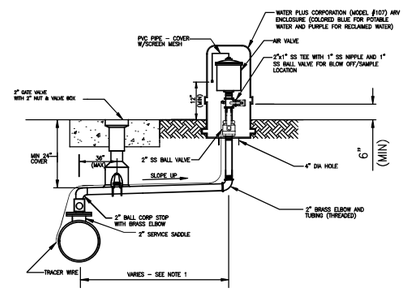
NOTE:
LOCATOR WIRE ACCESS-2" SCH 80 PVC, FEMALE ADAPTER COUPLING AND 2" BRASS PLUG W/ RECESSED NUT. TERMINATE INSULATED, SOLID 14 GAUGE COPPER LOCATOR WIRES AT TOP W/ 12" OF EXTRA WIRE

PLAN VIEW



VALVE COLLAR AND IDENTIFICATION DISK
NTS

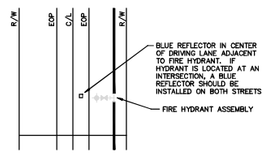
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APRIL 2020
W-5



NOTES:
1. OFFSET DISTANCE SHOWN ON DRAWINGS.
2. ADJUST HORIZONTAL LOCATION OF ARV ENCLOSURE, AS REQUIRED TO AVOID SIDEWALK. LOCATE ARV ENCLOSURE WITHIN 1' OF R/W OR AS OTHERWISE DETERMINED BY THE CITY.

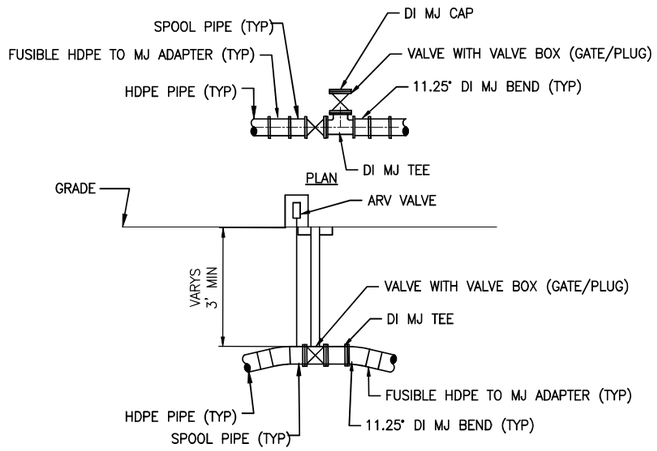
OFFSET AIR VALVE DETAIL
NTS

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FIRE HYDRANT REFLECTOR DETAIL
NOT TO SCALE

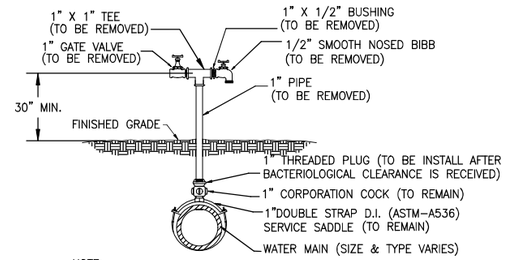
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W-11



SECTION

HDD TO HDD TRANSITION DETAIL (1)
NTS

NOTES:
(1) ALL CONNECTIONS SHALL BE RESTRAINED.
(2) FITTING CALLOUTS AS SHOWN IN DETAIL ARE FOR CONCEPTUAL PURPOSES. SEE PLANS FOR SPECIFIC FITTING CALLOUTS AT HDD TO HDD TRANSITIONS AND OTHER LOCATIONS.



NOTE:
1) LOCATION OF SAMPLE POINT BIBB SHALL NOT BE WITHIN THE ROADWAY BUT ROUTED TO THE ROADWAY SHOULDERS (NON-TRAFFIC AREAS) OF THE ROAD (WHERE APPLICABLE)
2) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL PIPING & FITTINGS NOTED AFTER BACTERIOLOGICAL CLEARANCE IS RECEIVED FROM THE HEALTH DEPARTMENT.

1" BACTERIOLOGICAL SAMPLE POINT DETAIL
N.T.S.

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DRAWN S SIMS
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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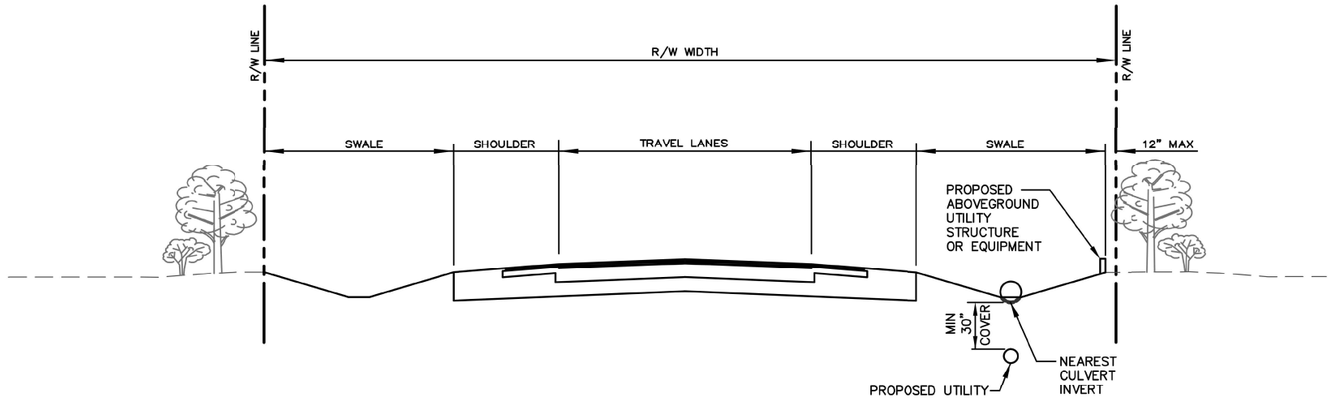
PROJECT NO: 26110-051-01
DATE: SEPT 2023
INDEX NO:
DWG NO: C25

Approved 2023-H-3-00197 James A. Meyer 11/6/2023

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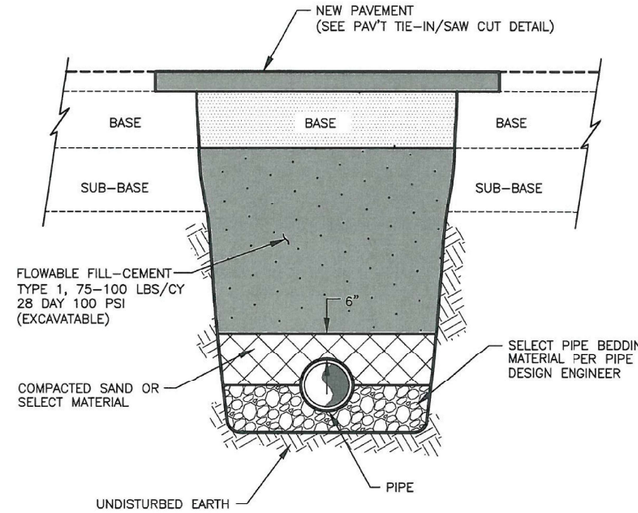


UTILITY INSTALLATION IN SWALE NEAR CULVERT
NTS

NOTE:
NO DEVIATIONS TO THIS DETAIL WILL BE PERMITTED UNLESS APPROVED BY THE COUNTY ENGINEER.
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PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	UTILITY INSTALLATION DETAIL RURAL ROADWAY TYPICAL SECTION	Sheet No. 1 of 1 Index No. 301
	APPROVED BY JCW BCC APPROVAL REVISED	



TYPICAL TRENCH SECTION
NTS

NOTE:
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09/07/08

PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	FLOWABLE FILL	Sheet No. 1 of 1 Index No. 103
	APPROVED BY JCW BCC APPROVAL REVISED	

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
MSS CHECKED D PLAVCAN

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

CIVIL DETAILS

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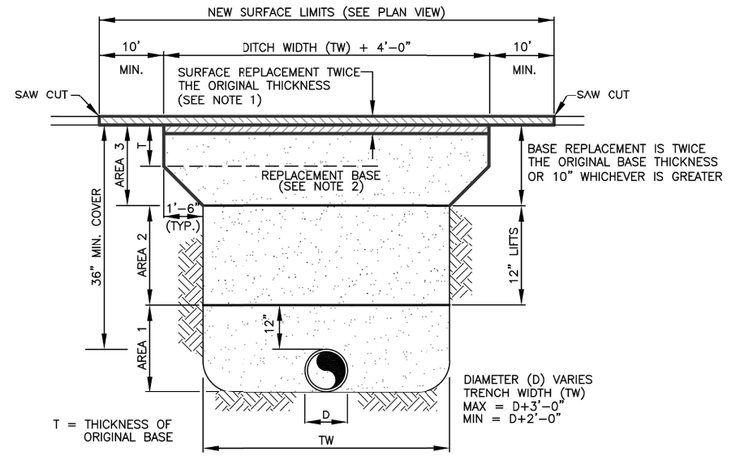
PROJECT NO: 26110-051-01	DATE: SEPT 2023
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NOTES

1. REPLACEMENT ASPHALT SHALL BE TWICE THE ORIGINAL PAVEMENT THICKNESS WITH A MINIMUM OF TWO (2) INCHES AND SHALL BE SP 12.5 OR TYPE S-3 ASPHALT, AND FC-3 IF REQUIRED.
2. REPLACEMENT BASE SHALL BE NEW MATERIAL NOT REUSED FROM EXCAVATION. ACCEPTABLE BASE ALTERNATIVE SHALL BE TYPE ABC OR BETTER ASPHALT PLACED AT A TOTAL THICKNESS OF SIX (6) INCHES.
3. AREA 1 – BACKFILL SHALL BE PLACED IN SIX (6) INCH LIFT WITH EACH LIFT COMPACTED TO **98% OF ASTM FM5-521** USING MECHANICAL TAMPERS.
4. AREA 2 – BACKFILL SHALL BE PLACED IN TWELVE (12) INCH LIFTS WITH EACH LIFT COMPACTED TO **98% OF FM5-521** USING APPROPRIATE COMPACTING EQUIPMENT.
5. AREA 3 – LIMEROCK (LBR 100) BASE SHALL BE CONSTRUCTED IN LIFTS NOT GREATER THAN SIX (6) INCHES COMPACTED THICKNESS, AND HAVE A DENSITY EQUAL TO **98% OF FM5-521**.
6. FLOWABLE FILL MAY BE PLACED ABOVE AREA 1 UP TO THE BOTTOM OF THE RESTORED BASE. MIX DESIGN SHALL CONFORM TO FDOT STANDARD SPECIFICATIONS SECTION 121. IF FLOWABLE FILL IS USED FOR TRENCH BACKFILL, THE AMOUNT OF COVER ABOVE TOP OF PIPE TO AREA 2 MAY BE REDUCED TO 6 INCHES.

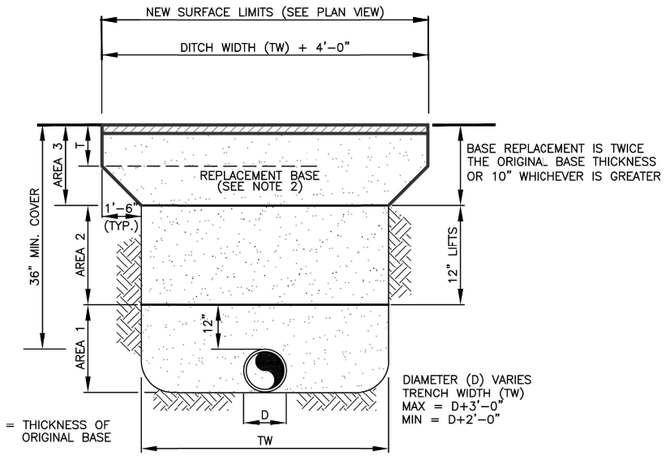
Tests shall be submitted to Pasco County Engineering Inspections verifying open cut restoration is per general notes before release of permit or gurantee, if applicable. Material and thickness verification shall be required. All testing shall be Pasco County Services Department Testing Specificatiions for Construction of Roads, Storm Drainage and Utilities; October 2006.

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PASCO COUNTY ENGINEERING SERVICES **DESIGN STANDARDS**	**OPEN CUT RESTORATION**		Sheet No. 1 of 1
	APPROVED BY MICHAEL J. GARRETT, P.E.	BCC APPROVAL REVISED	Index No. 102

TYPICAL ASPHALT PAVEMENT RESTORATION DETAIL 1

NTS



NOTES

1. REPLACEMENT ASPHALT SHALL BE TWICE THE ORIGINAL PAVEMENT THICKNESS WITH A MINIMUM OF TWO (2) INCHES AND SHALL BE SP 12.5 OR TYPE S-3 ASPHALT, AND FC-3 IF REQUIRED.
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PASCO COUNTY ENGINEERING SERVICES **DESIGN STANDARDS**	**OPEN CUT RESTORATION**		Sheet No. 1 of 1
	APPROVED BY MICHAEL J. GARRETT, P.E.	BCC APPROVAL REVISED	Index No. 102

TYPICAL LIMEROCK RESTORATION DETAIL 2

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DRAWN S SIMS
CHECKED D PLAVCAN

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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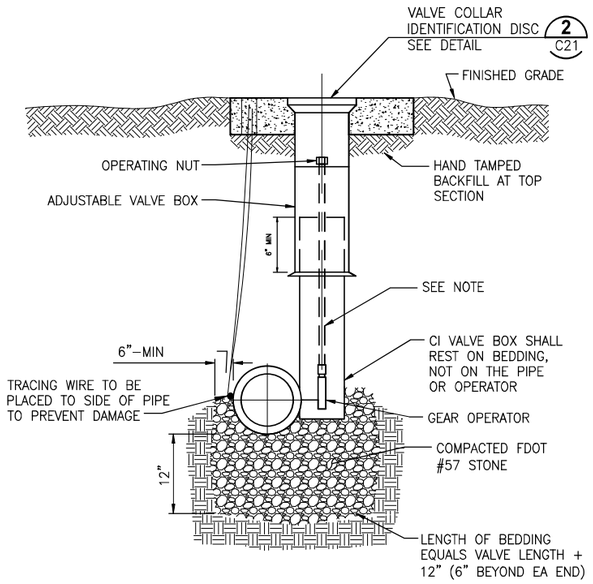
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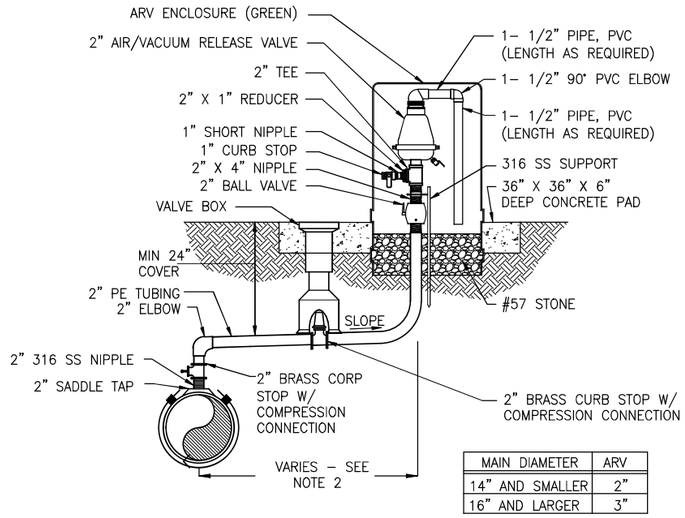
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NOTES:

1. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.
2. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.

PLUG VALVE 1
NTS

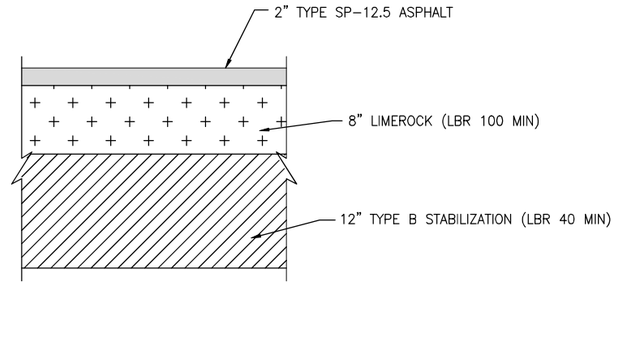


MAIN DIAMETER	ARV
14" AND SMALLER	2"
16" AND LARGER	3"

NOTES:

1. FOR WASTEWATER USE ONLY.
2. OFFSET DISTANCE TO BE FIELD DETERMINED AND AS CLOSE TO THE R/W LINE AS POSSIBLE.
3. ADJUST HORIZONTAL LOCATION OF SIDEWALK, AS REQUIRED TO AVOID ARV ENCLSOURE.
4. LOCATE ARV ENCLOSURE WITHIN 6" OF R/W LINE.

COMBINATION AIR/VACUUM RELEASE VALVE DETAIL 2
NTS



TYPICAL ASPHALT PAVEMENT DETAIL 3
NTS

BID DOCUMENTS

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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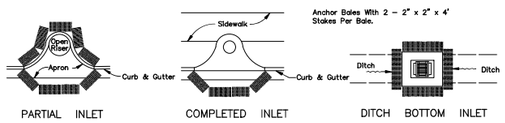
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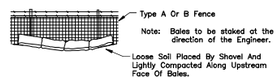
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EROSION AND SEDIMENT CONTROL NOTES

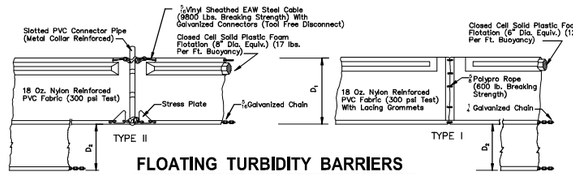
1. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING SILT FROM SITE IF NOT REUSABLE ON-SITE AND ASSURING PLAN ALIGNMENT AND GRADE IN ALL DITCHES AND SWALES AT COMPLETION OF CONSTRUCTION.
2. THE SITE CONTRACTOR IS RESPONSIBLE FOR REMOVING THE TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES AFTER COMPLETION OF CONSTRUCTION AND ONLY WHEN AREAS HAVE BEEN STABILIZED.
3. ADDITIONAL PROTECTION – ON-SITE PROTECTION IN ADDITION TO THE ABOVE MUST BE PROVIDED THAT WILL NOT PERMIT SILT TO LEAVE THE PROJECT CONFINES DUE TO UNSEEN CONDITIONS OR ACCIDENTS.
4. CONTRACTOR SHALL INSURE THAT ALL DRAINAGE STRUCTURES, PIPES, ETC. ARE CLEANED OUT AND WORKING PROPERLY AT TIME OF ACCEPTANCE.
5. WIRE MESH SHALL BE LAID OVER THE DROP INLET SO THAT THE WIRE EXTENDS A MINIMUM OF 1 FOOT BEYOND EACH SIDE OF THE INLET STRUCTURE. HARDWARE CLOTH OR COMPARABLE WIRE MESH WITH 1/2-INCH OPENINGS SHALL BE USED. IF MORE THAN ONE STRIP OF MESH IS NECESSARY, THE STRIPS SHALL BE OVERLAPPED.
6. FDOT NO. 1 COARSE AGGREGATE SHALL BE PLACED OVER THE WIRE MESH AS INDICATED IN D-903. THE DEPTH OF STONE SHALL BE AT LEAST 12 INCHES OVER THE ENTIRE INLET OPENING. THE STONE SHALL EXTEND BEYOND THE INLET OPENING AT LEAST 18 INCHES ON ALL SIDES.
7. IF THE STONE FILTER BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER ADEQUATELY PERFORMS ITS FUNCTION, THE STONES MUST BE PULLED AWAY FROM THE INLET, CLEANED AND REPLACED.
8. BALES SHALL BE EITHER WIRE-BOUND OR STRING-TIED WITH THE BINDINGS ORIENTED AROUND THE SIDES RATHER THAN OVER AND UNDER THE BALES.
9. BALES SHALL BE PLACED LENGTHWISE IN A SINGLE ROW SURROUNDING THE INLET, WITH THE ENDS OF ADJACENT BALES PRESSED TOGETHER.
10. THE FILTER BARRIER SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED TO A MINIMUM DEPTH OF 8 INCHES. AFTER THE BALES ARE STAKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AND COMPACTED AGAINST THE FILTER BARRIER.
11. EACH BALE SHALL BE SECURELY ANCHORED AND HELD IN PLACE BY AT LEAST TWO STAKES OR REBARS DRIVEN THROUGH THE BALE.
12. LOOSE STRAW SHOULD BE WEDGED BETWEEN BALES TO PREVENT WATER FROM ENTERING BETWEEN BALES.
13. STRAW BALE BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
14. CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED BALES, END RUNS AND UNDERCUTTING BENEATH BALES.
15. NECESSARY REPAIRS TO BARRIERS OR REPLACEMENT OF BALES SHALL BE ACCOMPLISHED PROMPTLY.
16. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE STRAW BALE BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.
17. SILT FENCES AND FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
18. SHOULD THE FABRIC ON A SILT FENCE OR FILTER BARRIER DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
19. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-THIRD THE HEIGHT OF THE BARRIER.
20. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.
21. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
22. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
23. THE CONTRACTOR IS RESPONSIBLE FOR FOLLOWING THE BEST EROSION AND SEDIMENT CONTROL PRACTICES AS OUTLINED IN THE PLANS, SPECIFICATIONS AND ST. JOHNS RIVER WATER MANAGEMENT DISTRICT SPECIFICATIONS AND CRITERIA.
24. FOR ADDITIONAL INFORMATION ON SEDIMENT AND EROSION CONTROL REFER TO "THE FLORIDA DEVELOPMENT MANUAL – A GUIDE TO SOUND LAND AND WATER MANAGEMENT" FROM THE STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION (F.D.E.R.) CHAPTER 6.
25. EROSION AND SEDIMENT CONTROL BARRIERS SHALL BE PLACED ADJACENT TO ALL WETLAND AREAS WHERE THERE IS POTENTIAL FOR DOWNSTREAM WATER QUALITY DEGRADATION. SEE DETAIL SHEET FOR TYPICAL CONSTRUCTION.
26. ALL DISTURBED AREAS SHALL BE GRASSED, FERTILIZED, MULCHED AND MAINTAINED UNTIL A PERMANENT VEGETATIVE COVER IS ESTABLISHED.
27. SOD SHALL BE PLACED IN AREAS WHICH MAY REQUIRE IMMEDIATE EROSION PROTECTION TO ENSURE WATER QUALITY STANDARDS ARE MAINTAINED.
28. ANY DISCHARGE FROM DEWATERING ACTIVITY SHALL BE FILTERED AND CONVEYED TO THE OUTFALL IN A MANNER WHICH PREVENTS EROSION AND TRANSPORTATION OF SUSPENDED SOLIDS TO THE RECEIVING OUTFALL.
29. DEWATERING PUMPS SHALL NOT EXCEED THE CAPACITY OF THAT WHICH REQUIRES A CONSUMPTIVE USE PERMIT FROM THE ST. JOHNS RIVER WATER MANAGEMENT DISTRICT.
30. ALL DISTURBED AREAS TO BE STABILIZED THROUGH COMPACTION, SILT SCREENS, HAY BALES, AND GRASSING. ALL FILL SLOPES 3:1 OR STEEPER TO RECEIVE STAKED SOLID SOD.
31. ALL DEWATERING, EROSION, AND SEDIMENT CONTROL TO REMAIN IN PLACE AFTER COMPLETION OF CONSTRUCTION AND REMOVED ONLY WHEN AREAS HAVE STABILIZED.
32. THIS PLAN INDICATES THE MINIMUM EROSION AND SEDIMENT MEASURES REQUIRED FOR THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR MEETING ALL APPLICABLE RULES, REGULATIONS AND WATER QUALITY GUIDELINES AND MAY NEED TO INSTALL ADDITIONAL CONTROLS.
33. THE CONTRACTOR SHALL BE REQUIRED TO RESPOND TO ALL WATER MANAGEMENT DISTRICT INQUIRIES, RELATIVE TO COMPLIANCE OF SJRWMD FOR EROSION AND SEDIMENTATION CONTROL. THE COST OF THIS COMPLIANCE SHALL BE PART OF THE CONTRACT.



PROTECTION AROUND INLETS OR SIMILAR STRUCTURES

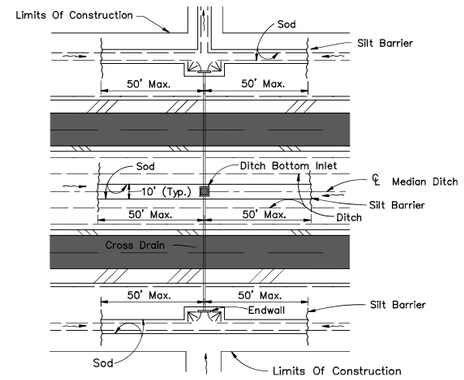


BALES BACKED BY FENCE

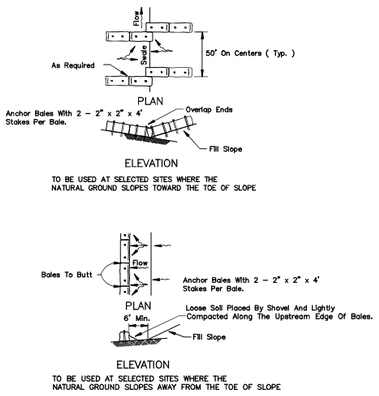


FLOATING TURBIDITY BARRIERS

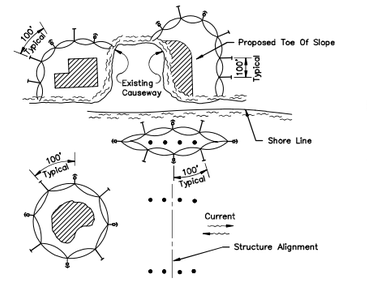
NOTICE:
COMPONENTS OF TYPES I & TYPE II MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES I AND II SHALL BE AS APPROVED BY THE ENGINEER.



DITCH INSTALLATIONS AT DRAINAGE STRUCTURES

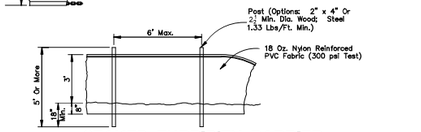


BARRIERS FOR FILL SLOPES

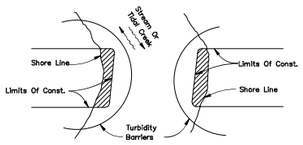


LEGEND
- Pile Locations
- Dredge Or Fill Area
- Mooring Buoy w/Anchor
- Anchor
- Barrier Movement Due To Current Action

NOTES:
1. Turbidity barriers are to be used in all permanent bodies of water regardless of water depth.
2. Number and spacing of anchors dependent on current velocities.
3. Deployment of barrier around pile locations may vary to accommodate construction operations.
4. Navigation may require segmenting barrier during construction operations.
5. For additional information see Section 104 of the FDOT Standard Specifications.



STAKED TURBIDITY BARRIER



Notes:
Turbidity barriers for flowing streams and tidal creeks may be either floating, or staked types or any combinations of types that will suit site conditions and meet erosion control and water quality requirements. The barrier type(s) will be at the Contractors option unless otherwise specified in the plans, however payment will be under the contract lump sum price established in the bid proposal for Erosion & Sediment Control Posts in staked turbidity barriers to be installed in vertical position unless otherwise directed by the Engineer.

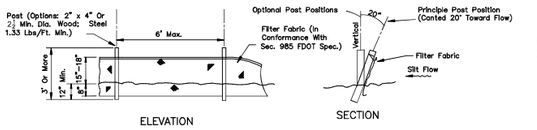
TURBIDITY BARRIER APPLICATIONS

TURBIDITY BARRIERS

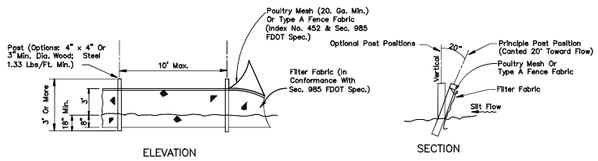
(D-907)
N.T.S.

HAY BALE LOCATION

(D-901)
N.T.S.

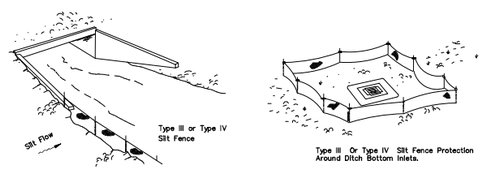


TYPE III SILT FENCE

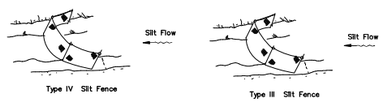


Note: Silt Fence to be paid for under the contract lump sum price for Erosion and Sediment Control.

TYPE IV SILT FENCE



Do not deploy in a manner that silt fences will act as a dam across permanent flowing watercourses. Silt fences are to be used at upland locations and turbidity barriers used at permanent bodies of water.

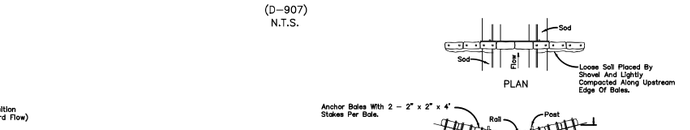


Note: Spacing for Type III & TYPE IV Fence to be in accordance with Chart 1, Sheet 1 of 3, FDOT Index No. 102 and ditch installations at drainage structures Sheet 2 of 3, FDOT Index No. 102.

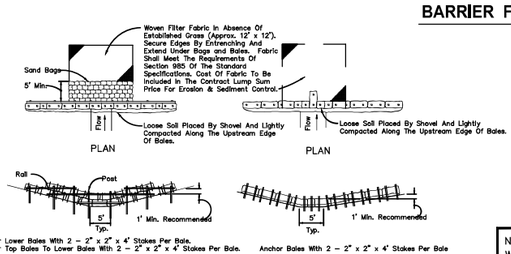
SILT FENCE APPLICATIONS

SILT FENCE TYPE III & IV

(D-908)
N.T.S.



BARRIER FOR PAVED DITCH



Application and Spacing: The use of Types I & II bale barriers should be limited to the conditions outlined in Chart 1, Sheet 1 of 3, Index No. 102

BARRIER FOR UNPAVED DITCHES

NOTE:
WHERE FDOT SPECS AND INDEX ARE REFERENCED, PLEASE REFER TO FDOT ROADWAY & TRAFFIC DESIGN STANDARDS, AND FDOT STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION.

HAY BALE BARRIERS TYPE I & II

(D-912)
N.T.S.

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

STORMWATER POLLUTION PREVENTION DETAILS

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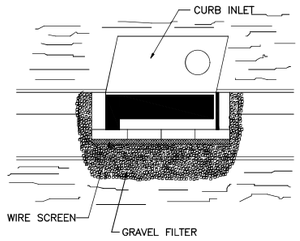
PROJECT NO: 26110-051-01
DATE: SEPT 2023
INDEX NO:
DWG NO: EC1

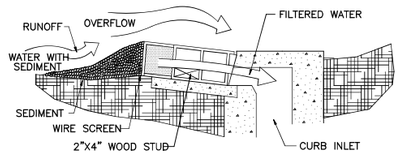
Approved
2023-H-03-00197
James A. Meyer
11/6/2023

SAVED: 8/11/2023 4:03 PM SSIMS Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\051-01 SOUTH 301 W-WW PIPELINES\DESIGN&CONSTRUCTION\CAD\DWGS\ENV\26110051101-EC02.DWG

PLOTTED: 9/22/2023 3:11:18 PM KENNETH A. FRASER, PE

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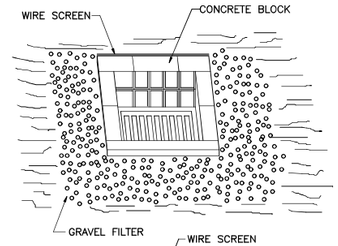


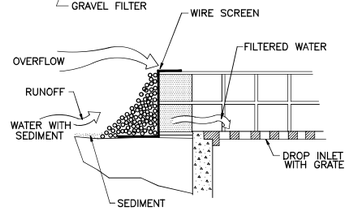
SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE AN OVERFLOW CAPABILITY IS NECESSARY TO PREVENT EXCESSIVE PONDING IN FRONT OF THE STRUCTURE.

BLOCK & GRAVEL CURB INLET SEDIMENT FILTER

(D–902)
N.T.S.





SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.

BLOCK & GRAVEL DROP INLET SEDIMENT FILTER

(D–904)
N.T.S.

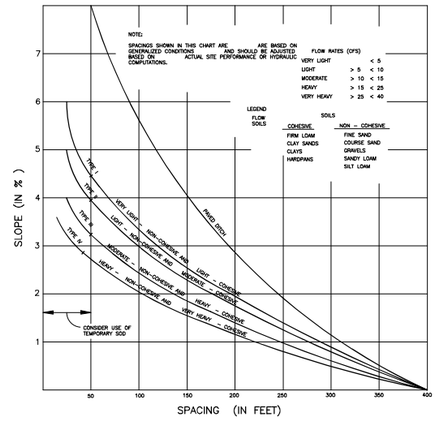
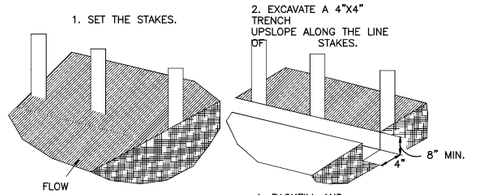


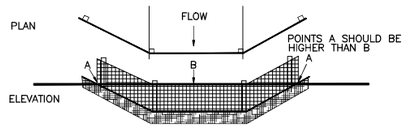
CHART I

RECOMMENDED SPACING FOR TYPE I AND TYPE II HAY BALE BARRIERS, AND TYPE III AND TYPE IV SILT FENCES AND PAVED DITCH HAY BALE BARRIERS

SPACING RECOMMENDATION FOR SILT FENCES & HAY BALES

(D–906)
N.T.S.

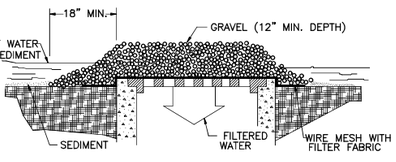




PROPER PLACEMENT OF A FILTER BARRIER IN A DRAINAGE WAY

FILTER BARRIER CONSTRUCTION DETAIL

(D–910)
N.T.S.



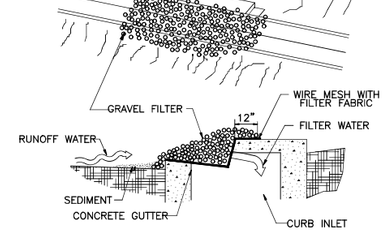
GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY CONCEN– TRATED FLOWS ARE EXPECTED, BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

GRAVEL INLET SEDIMENT TRAP

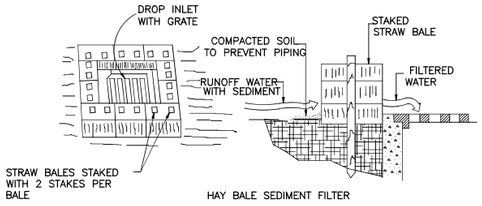
(D–903)



GRAVEL CURB INLET SEDIMENT FILTER

SPECIFIC APPLICATION

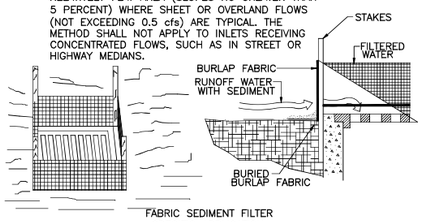
THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE PONDING IN FRONT OF THE STRUCTURE IS NOT LIKELY TO CAUSE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.



HAY BALE SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 cfs) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.



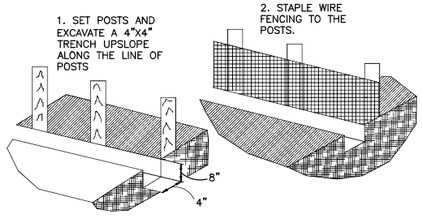
FABRIC SEDIMENT FILTER

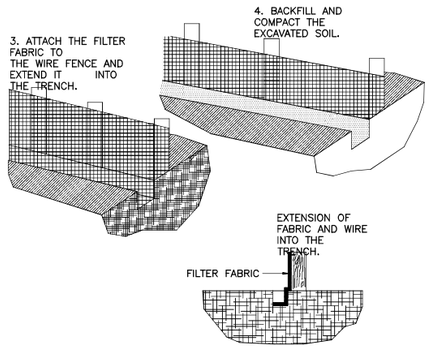
SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 cfs) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS. SUCH AS IN STREET OR HIGHWAY MEDIANS.

DROP INLET SEDIMENT TRAP

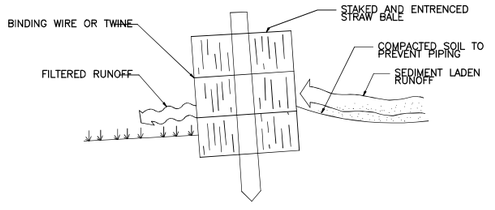
(D–905)





CONSTRUCTION DETAILS FOR SILT FENCES

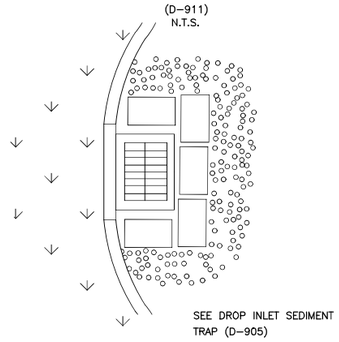
(D–909)
N.T.S.



CROSS–SECTION OF A PROPERLY INSTALLED STRAW BALE

STAKED HAY BALE

(D–911)
N.T.S.



ERECT SEDIMENT BARRIERS AT CATCH BASINS

(TYPICAL)

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

STORMWATER POLLUTION PREVENTION DETAILS

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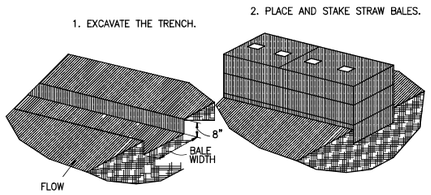
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PROJECT NO: 26110–051–01
DATE: SEPT 2023
INDEX NO:
DWG NO: EC2

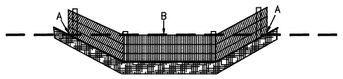
Approved
2023-H-3-00197
James A. Meyer
11/6/2023

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PLOTTED: 9/22/2023 3:11:29 PM KENNETH A. FRASER, PE
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CONSTRUCTION OF A HAY BALE BARRIER

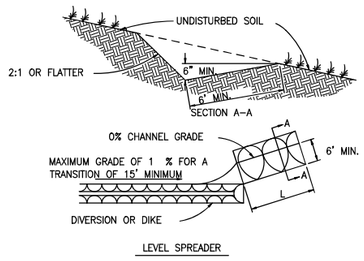


POINTS A SHOULD BE HIGHER THAN POINT B

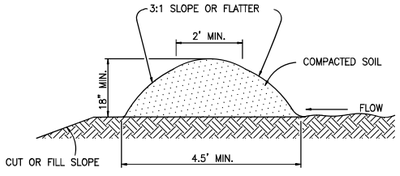
PROPER PLACEMENT OF HAY BALE BARRIER IN DRAINAGE WAY

HAY BALE BARRIER CONSTRUCTION DETAILS

(D-913)
N.T.S.



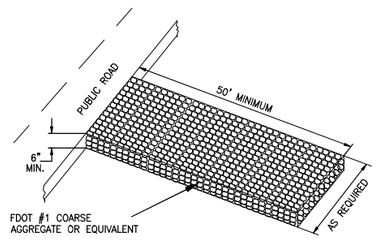
LEVEL SPREADER



TEMPORARY DIVERSION DIKE

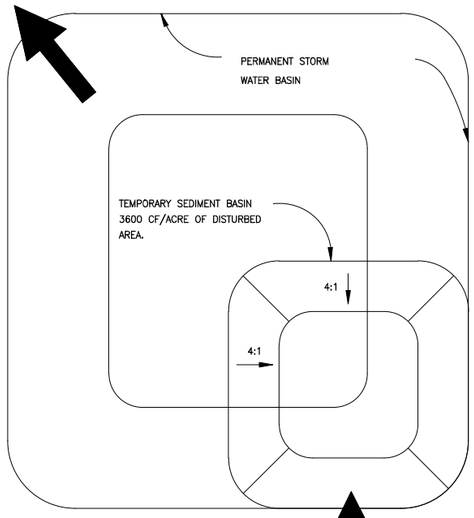
DIVERSION DIKE

(D-914)
N.T.S.



STABILIZED CONSTRUCTION ENTRANCE

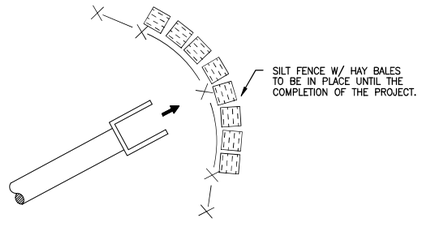
N.T.S.



NOTE: THIS REPRESENT THE OPTIMUM LOCATION OF THE TEMPORARY SEDIMENT BASIN. OTHER ON-SITE LOCATIONS MAY ALSO BE APPROPRIATE.

TEMPORARY SEDIMENT BASIN

N.T.S.



OUTLET PROTECTION

N.T.S.

BID DOCUMENTS

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

STORMWATER POLLUTION PREVENTION DETAILS

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PROJECT NO: 26110-051-01
DATE: SEPT 2023
INDEX NO:
DWG NO: EC3

Approved
2023-H-3003-00197
James A. Meyer
11/6/2023

SR 41 (US 301)

TUCKER RD

R/W LINE

+40.21
138.81' LT

+82.30
66.96' LT

+77.09
67.28' LT

+07.05
67.29' LT

+96.03
64.23' LT

+96.02
60.79' LT

+23.67
21.60' LT

+23.67
17.40' LT

+23.67
6.16' LT

+23.67
4.50' LT

END PROJECT
END MILLING & RSF.
STA. 397+23.67

+23.67
4.60' RT

+23.67
5.81' RT

+23.67
18.31' RT

+23.67
23.65' RT

+00.00
1.47' LT

+00.00
0.56' RT

+01.56
35.00' RT

+79.97
35.00' RT

+51.58
58.23' RT

764+86.17
50.00' LT

765+17.30
50.00' LT

HDD

HDD

PT STA. 767+74.26

PT +85.95

℄ SURVEY

N 0°05'44" W

CURVE C2

℄ SR39

CURVE BL SR391

SR 39 / PAUL S. BUCHMAN HWY

393 394 395 396 397 398 764 765 766 767 768 769

B A I

0 10 40
Feet

LEGEND:

(X) PAVEMENT DESIGN SEE TYPICAL SECTIONS

MILLING DEPTHS

1.5-IN

3-IN

4.5-IN

6.5-IN

7-IN

CURVE DATA BL SR391
PI STA. = 767+74.26 (BL SR 39)
Δ = 27° 07' 00" (RT)
D = 2° 00' 00"
T = 690.86
L = 1,355.83
R = 2,864.79
PC STA. = 760+83.40
PT STA. = 774+39.23
e = 0.04 (Exist.)

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RICHARD C. ENDRZEJEWSKI, P.E.
P.E. LICENSE NUMBER 70853
ELEMENT ENGINEERING GROUP
1713 E. 9th AVENUE
TAMPA, FL 33605

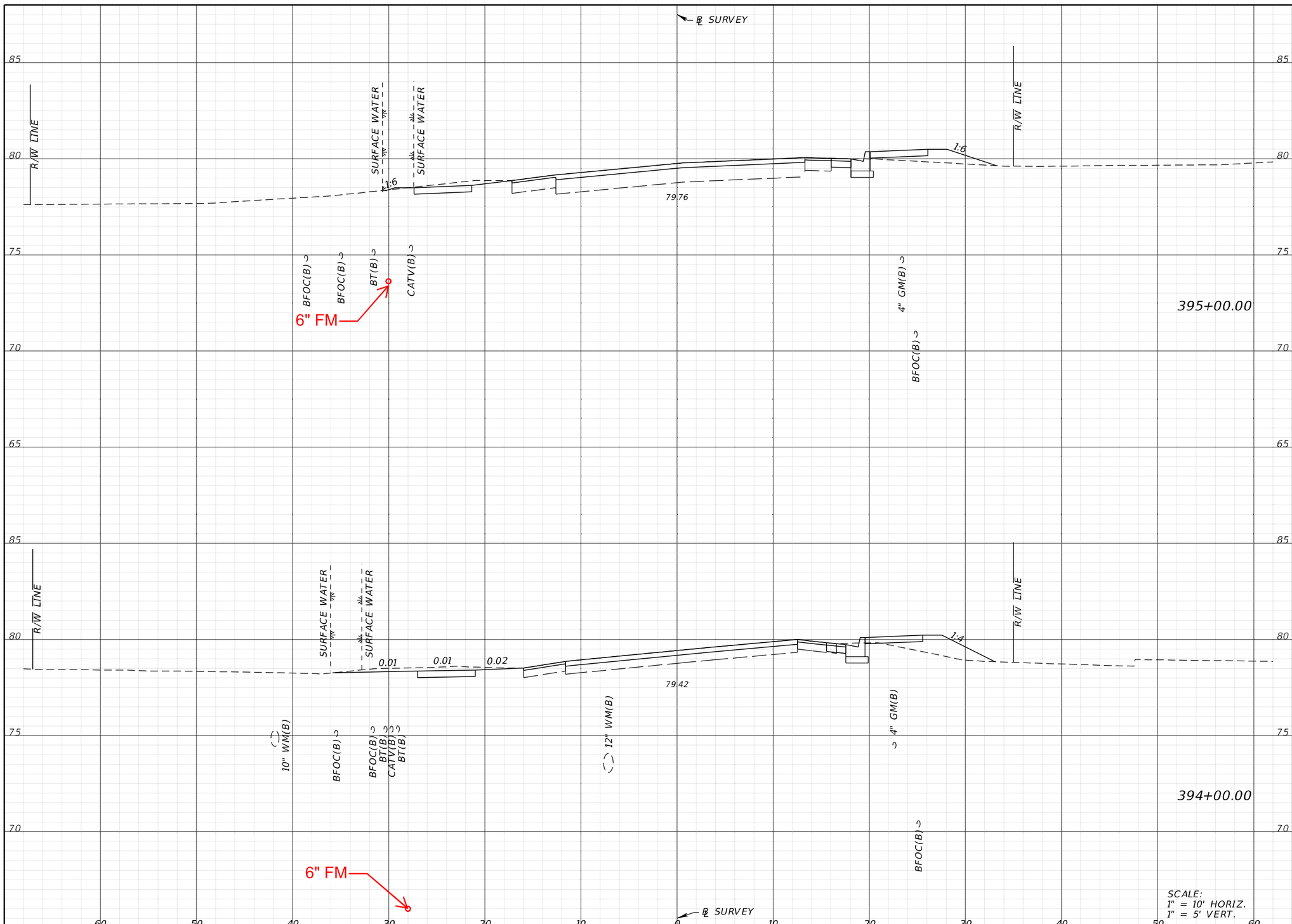
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 41	PASCO	440063-1-52-01

PAVEMENT MILLING DETAILS

SHEET NO. 46

Approved
2023-H-750-00197
James A. Meyer
11/6/2023



Regular Exc.		Embankment	
A	V	A	V
6.31	26.1	4.32	19.6
7.81	49.2	6.28	14.3

SCALE:
1" = 10' HORIZ.
1" = 5' VERT.

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REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RICHARD C. ENDRZEJEWSKI, P.E.
P.E. LICENSE NUMBER 70853
ELEMENT ENGINEERING GROUP
1713 E. 9th AVENUE
TAMPA, FL 33605

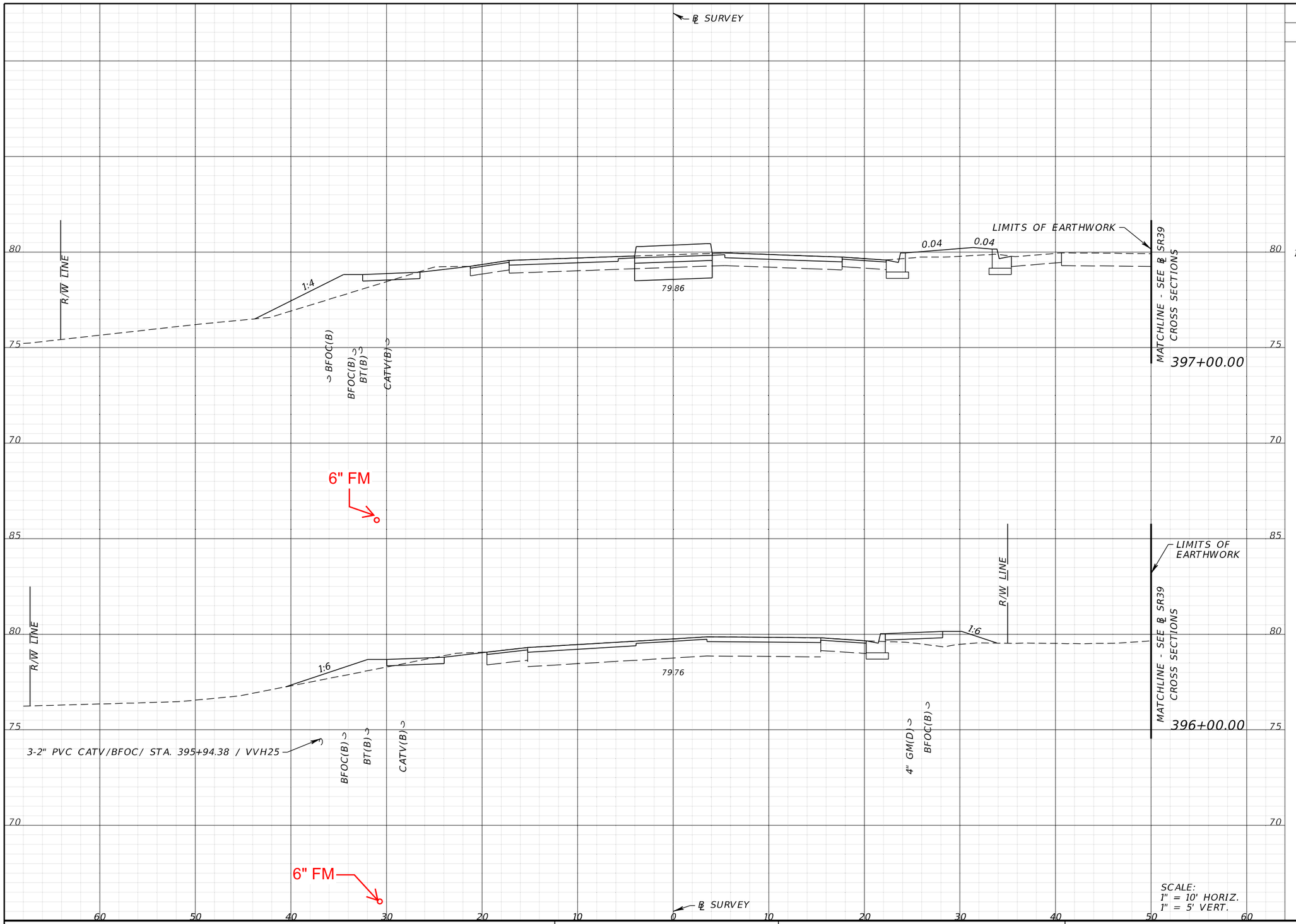
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 41	PASCO	440063-1-52-01

CROSS SECTIONS

SHEET NO. 135

Approved
2023-H-79-00197
James A. Meyer
11/6/2023



Regular Exc.		Embankment	
A	V	A	V
15.80	35.6	11.28	35.0
3.42	18.0	7.64	22.1

SCALE:
1" = 10' HORIZ.
1" = 5' VERT.

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RICHARD C. ENDRZEJEWSKI, P.E.
P.E. LICENSE NUMBER 70853
ELEMENT ENGINEERING GROUP
1713 E. 9th AVENUE
TAMPA, FL 33605

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 41	PASCO	440063-1-52-01

CROSS SECTIONS

SHEET NO. 136

Approved
2023-H796-00197
James A. Meyer
11/6/2023

M E M O R A N D U M

FLORIDA DEPARTMENT OF TRANSPORTATION
District Utilities MS 7-820

DATE: 11/06/2023

TO: Tyler Matthews, Brooksville Operations Engineer
Alejandro Pina, Brooksville Construction Engineer

FROM: Joe Goddard, Utility Construction Manager Joe Goddard

COPIES: Marty Davis, Construction Project Administrator
Zachary Stringer, Construction Manager Project File

SUBJECT: FPN: 440063-1-52-01
Permit No. 2023-H-798-00197

Please find attached the Utility Permit on the above referenced project from the City of Zephyrhills.

The scope of work under this permit is for adjustment of existing facilities along the US 301/SR 41 corridor to accommodate the proposed FDOT improvements. The installation has been reviewed with the Construction Resident Office and special requirements are listed below.

- City of Zephyrhills representatives will need to contact Joe Goddard (727-543-3614) 7 days prior to beginning utility installations.

The Zephyrhills pipeline project is on a 15-month construction schedule as follows:

- **First week of January 2024: begin shop drawing review and material procurement. (3 months)**
- **March 2024: begin construction at the northernmost end of the construction corridor. (12 months)**

With the Tucker-road crossing at the southernmost end of the project, it is anticipated this section of the project would not be impacted until the fall of 2024.

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

M E M O R A N D U M

FLORIDA DEPARTMENT OF TRANSPORTATION
District Utilities MS 7-820

- Please ensure the City of Zephyrhills is clear of drainage structures & drainage pipe throughout the project limits. Along with understanding the size of the structures that will be installed and needing proper shoring and stabilizing methods with the surrounding areas around the structure, and clear of Light Pole and Mast Arms Foundations throughout the project.

- Be aware that the facilities that the City of Zephyrhills is installing are for the UAO's benefit. They are aware of the upcoming FDOT projects and that any placements within this permit will be relocated at the UAO's cost in coordination with the proposed upcoming road improvement project 440063-1.

- Please provide certified as-built data on the approved submitted FDOT plan sets of City of Inverness underground installations, within 45 days after completion. (ie. Elevation, offsets, & stationing)

Upon Final execution of this permit, please forward the District Utilities' copy to the Construction office indicated above with a copy of this memo attached.

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

SEE THE PERMIT - PART 2: Engineer responsible for inspection, PART 3: Completion date, PART 4: General Provisions, PART 5: Special Provisions.

SPECIAL PROVISIONS

This Permit subject to the following provisions, conditions and stipulations: This Permit issuances DOES NOT in any way approve the applicant's plan.

1. **Notification:** Contact the Florida Department of Transportation (FDOT) 48 hours before starting construction. (A pre-construction meeting and **liability insurance is required for all permits –see Permit Category, Permit page 1, part 1 Permit Information).**

   Contact: James Meyer, Permits Manager OR David Skrelunas Brooksville Operations Program Engineer
   16411 Spring Hill Dr. Brooksville, FL.34604 * 352- 848-2600 Monday -Thursday 7:00 A.M. to 5:30 P.M.

2. **Work and Material Standards -Specifications:** ***The FDOT standards, specifications and Permit take priority over the permittee's plans.*** All construction work and materials must (mandatory) be FDOT certified and in conformance with the latest edition of the FDOT *Standard Plans for Road and Bridge Construction (Standard Plans), Utility Accommodation Manual, Standard Specifications (Spec.s), Florida Design Manual* and *Flexible Pavement Design Manual for New Construction and Pavement Rehabilitation.*

3. **Maintenance of Traffic:** All Maintenance of Traffic (TTC) signs and markings (including for bicycles, sidewalks and pedestrians), for lane/road closures, detours and right of way work for construction and/or maintenance must be in conformance with the *Standard Plans 102 - 600 series (use appropriate SP for the work type - multi or two lanes, urban or rural roadways).* All work only during daytime unless otherwise approved, and off-peak work hours may be required. All night work or overnight MOT must be approved by the FDOT. Submit lane closure calculations as required. All MOT must be set up and maintained by a certified MOT work site safety supervisor.

4. **Driveway/Connection Design:** The driveway must be in conformance with the *Standard Plans 000-515* (Rural or Urban) including the radius, slopes and remove/replace the paved shoulder in front of the driveway (see Pavement Structure) to a matching roadway structural section. The driveway profile grade maximum is 10% for commercial and 28% for residential. Urban flared driveway with sidewalk must have the correct walkaround, flares, slopes, ramps and detectable warnings. See *Standard Plans 522-001, 522-002 and 000-515 sheets 2,3,4 of 7.*

5. **Roadway Widening Design:** All rural or urban roadway widening for more lanes in conjunction with a driveway must match existing roadway and slope (usually 2-3%) with a 11 feet wide outside paved shoulder (usually 5 feet wide with 6% slope paved and 6 feet wide 6% slope unpaved shoulder, left turn lane shoulders match existing median shoulders). The shoulder front ditch slope is usually 1 (rise) to 6 (run). Maintain clear recovery zone distances and if required use guardrails and handrails for excessive slopes and obstructions. The widening approach solid/skip striping pattern must be in conformance with *Standard Plan 711-001, sheet 5-14.*

6. **Drainage - Mitered End Sections:** All project drainage should be away from the FDOT roadway and right-of-way. The connection must drain away from the roadway for at least 5 feet. A Drainage Permit or exemption is required for any drainage work within or discharge to the FDOT right of way. The driveway and mitered end section *(Standard Plan 430-022)* including (correctly sized with beveled/radii corners and splash pads), pipe size and type, shoulder width and 1v:4h side slopes must be in conformance with *Standard Plan 430-022, 430-001 and 000-515.* All other drainage work and materials must be in conformance with F.D.M. and *Standard Plan 425-001 to 524-001*.

7. **Construction Stages –Time Period:** The permittee's engineer is responsible for inspection. All construction must be done in stages with each stage (for example) subgrade, base, etc. inspected and approved by the FDOT (or the inspection must be waived by the FDOT) before starting the next stage. Complete the construction in a timely manner and within one year of issuance as noted on the permit.

8. **Turn Lanes - Sight Distance:** The median opening and spacing, left turn lane transitions, queues and lengths must be in conformance with FDM. The sight distance and length must be in conformance with FDM.

9. **Signs and Striping:** All traffic signs, striping, raised pavement markers and pavement markings must be in conformance with FDOT Standard *Plan 11000 and 17000 series*. See *Standard Plan* for pavement markings, thermoplastic and traffic signs. Apply thermoplastic 14 days (no wait for concrete) after paving and apply interim striping until thermoplastic is applied. Remove existing striping by mill and resurface with matching asphalt (water blasting and grinding are not allowed). A rural commercial driveway must have at a minimum a high intensity reflective 36" R1-1 STOP sign with a 24" wide stop bar located between 12-25 feet away from the roadway.

10. **Sod and Erosion Control**: All areas in the right of way disturbed during construction must be restored, compacted, sodded and watered in conformance with the *Standard Specifications, Section 104* and *Standard Plan 570-001, 570-010.* Excess shoulder lime rock must be removed or mixed with a sufficient amount of soil and fertilizer to ensure growth. During construction install erosion control, silt fences, turbidity barriers etc. in conformance with *Standard Specifications, Section 104*, NPDES/DEP and SWPPP (Stormwater permit/plan) requirements.

11. **Pavement:** The mainline widening etc. (and the mainline shoulder in front of the connection must be removed and replaced), MUST match the mainline thickness, type of stabilization, base and structural course, friction course (FC), and aggregates etc. (course or fine graded), unless otherwise directed by the FDOT/engineer. Submit approved testing laboratory certification for the design mix and density test results. The density tests must be a minimum of 3 per section of widening for each lift, unless otherwise directed by the FDOT/engineer. The paving seam lines must align with striping, and if needed use compatible mill and overlay, resurface, leveling etc., over entire existing roadway to reduce old/new pavement joints. **Driveway Pavement:** The minimum driveway pavement section: (this driveway pavement is not for the mainline and does not replace a better or match existing pavement or as specified by the FDOT/engineer. For roadway widening see Pavement Design Manual design criteria; traffic volumes, rural/urban, multi/single lanes, loads, soil, speed etc.):

    A. Sub-base: Stabilized 12 inch below the base* or ***Skip to Option A-1***
    Base: 8-inch-thick primed lime rock (double course – 4-inch lifts) or B-12.5 (Superpave asphalt base) if required
    Surface: 1.5-inch-thick asphalt type SP or type S (and **FC shoulder as needed) (and/or match existing structural & FC)

    A-1. Sub-base: No sub grade is required
    Base: 12-inch-thick primed lime rock (6-inch lifts) * or B-12.5 (Superpave asphalt) if required (1.5 x 8" = 12" base)
    Surface: 1.5-inch-thick asphalt surface type SP or type S and **FC as needed (and/or match existing structural & FC)

    or B. Sub-base: No compaction specified*
    Base: 8-inch-thick Sand Asphalt Hot Mix (triple course – 3 lifts) 800 lb. stability
    Surface: 1.5-inch-thick asphalt type SP or type S and **FC as needed

    or C. 6-inch-thick of FDOT approved Class I 3000 psi concrete (6" for traffic bearing & 4" for sidewalk) on suitable soil with expansion joints as required. See *Standard Specifications 346 and 350*

    * The sub-base (stabilization) must extend 4 inches beyond the base above and/or the base must extend 4 inches beyond the pavement section above (or 4 inches beyond back of curb)
    **The FC may not be required on low volume/speed driveways beyond the mainline shoulder, providing the mainline and driveway surface difference ("lip") does not exceed the limit.

12. **Lime rock Base:** The lime rock base material must be from a FDOT approved source. At no time must a lift course thickness exceed 6 inches. The lime rock base must be in conformance with FDOT *Design Standards 514* and *Standard Specifications, Section 200.* The Type B-12.5 asphalt black base may be required by the FDOT to expedite work or for wet conditions etc.

13. **Site/Other Approvals/Permits**: The permittee must comply with all federal, state, county and local ordinances with proof of local site plan approval, Southwest Florida Water Management District and Turnpike District permits/approval, utility company notifications/locates and coordination with other FDOT projects etc. This connection must not be of any cost to the FDOT or interfere with other or FDOT projects.

14. **Easements/Dedications:** The permittee/engineer must ensure that all easements and dedications are recorded and submitted to FDOT before final acceptance of the permit.

15. **Quality Control and Acceptance:** The permittee and/or permittee's engineer is/are responsible for inspecting the work and material's and meet all FDOT indices, standards, specifications, conditions, qualified/approved/certified products and provisions of the permit. Submit a *Record Drawings Report by Permittee's Professional Engineer* (FDOT form 850-040-19) and AS BUILTS (if needed). The permit issuance

Authorized
2023.05.08 08:39:37
James A. Meyer

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

does not relieve the permittee, contractor and engineer from complying with FDOT requirements. The FDOT must accept the driveway BEFORE the driveway may be used. G:\PermitACCESS\Brooksville Forms\Permit Attachments - FDOT Attach this for permit issueance\PERMIT ATTACHMENT Special Provisions.doc

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

NOTES:

1. Cover or deactivate pedestrian traffic signal display(s) controlling closed crosswalks.

2. Place pedestrian LCDs across the full width of the closed sidewalk.

3. For post mounted signs located near or adjacent to a sidewalk, maintain a minimum 7' clearance from the bottom of the sign panel to the surface of the sidewalk.

4. "Sidewalk Closed" signs (R9-XX) may be mounted on pedestrian LCDs in accordance with the manufacturer's instructions.

5. Omit the Advance Closure LCD if it blocks access to other pedestrian facilities (e,g,, transit stops, residences, or business entrances).

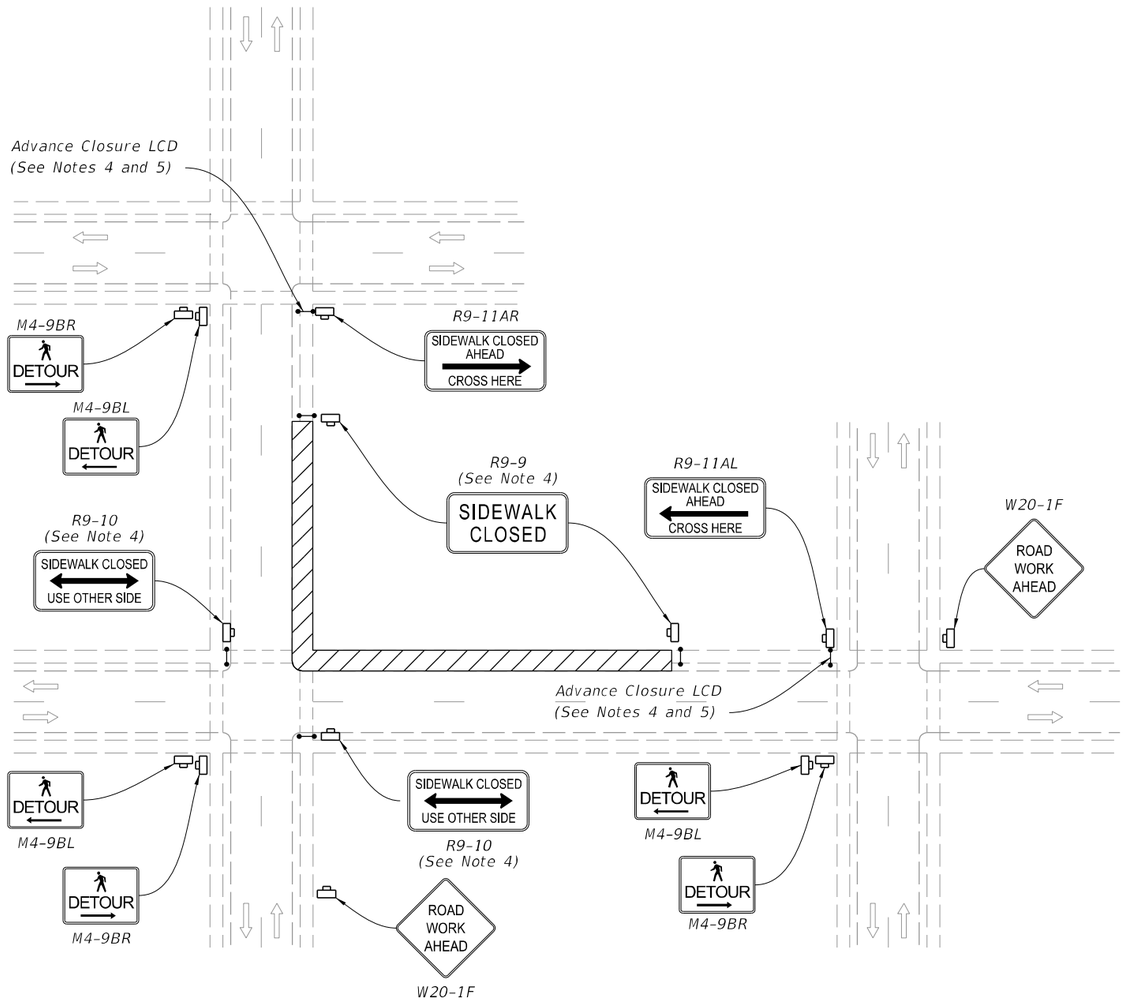
SYMBOLS:

Work Area

Work Zone Sign

Pedestrian Longitudinal Channelizing Device (LCD)

Lane Identification and Direction of Traffic



PEDESTRIAN DETOUR

9/21/2021 12:26:54 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	SIDEWALK CLOSURE	INDEX	SHEET
11/01/20						102-660	1 of 2

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

NOTES:

1. L = Taper Length
   B = Buffer Length
   X = Work Zone Sign Distance
   See Index 102-600 for "L", "B", "X", channelizing device spacing values.

2. Provide a 5' wide temporary pedestrian way with a maximum cross-slope of 0.02, except where space restrictions warrant a minimum width of 4'. Provide a 5' x 5' passing space for temporary pedestrian ways less than 5' in width at intervals not to exceed 200'.

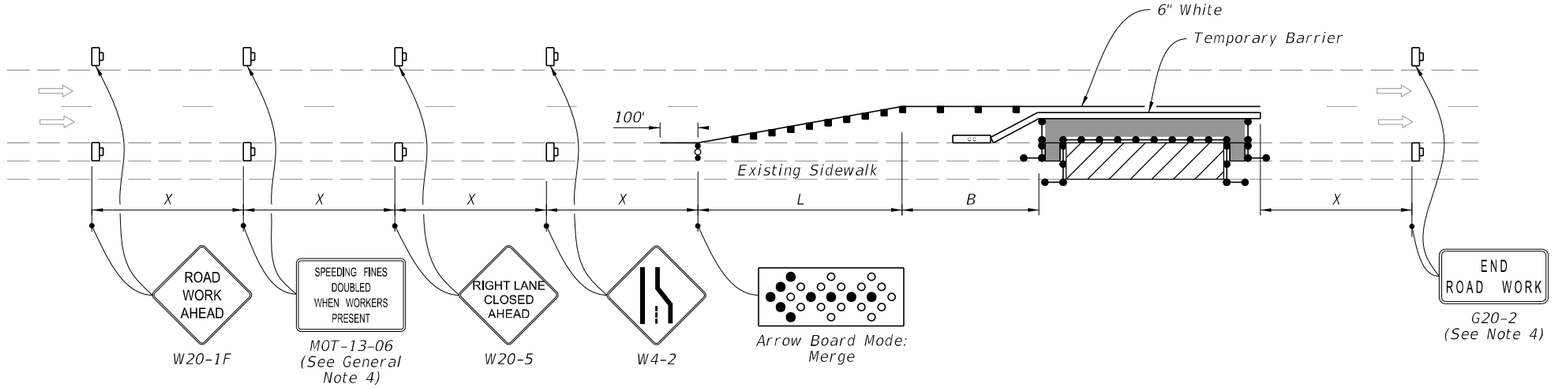
3. When temporary pedestrian ways require curb ramps, meet the requirements of Index 522-002. Detectable warnings are not required for curb ramps diverting pedestrian traffic into a closed lane.

4. The "Speeding Fines Doubled When Workers Present" signs (M0T-13-06) and "End Road Work" signs (G20-2), along with associated work zone sign distances, may be omitted when the work operation will be in place for 24 hours or less.

5. Pedestrian Diversion Option 2 may only be used when called for in the Plans or as approved by an Engineer.

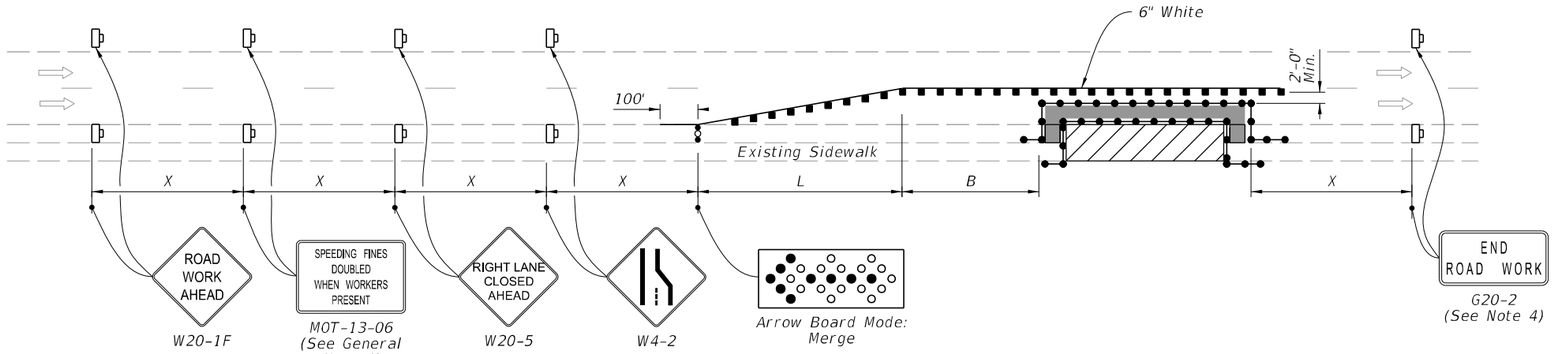
SYMBOLS:

- Work Area
- Temporary Pedestrian Way
- Channelizing Device (See Index 102-600)
- Pedestrian Longitudinal Channelizing Device (LCD)
- Work Zone Sign
- Arrow Board
- CC Crash Cushion
- Lane Identification and Direction of Traffic



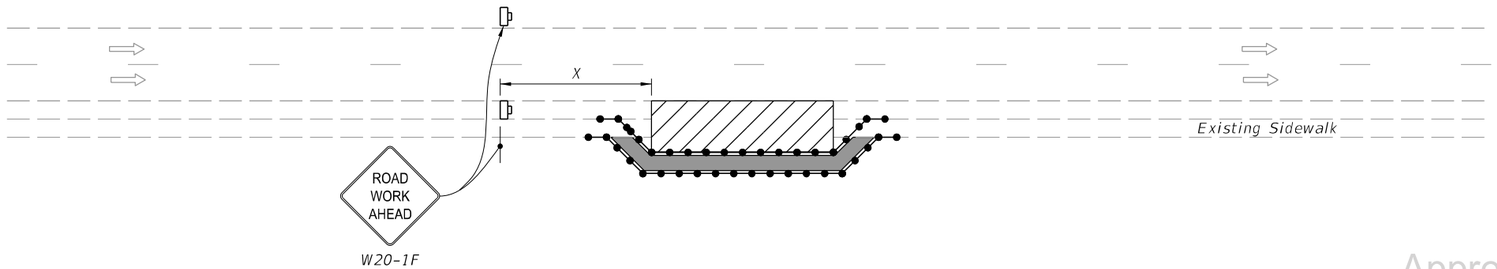
PEDESTRIAN DIVERSION - OPTION 1

(Temporary Barrier Shown, Low Profile Barrier Similar)



PEDESTRIAN DIVERSION - OPTION 2

(Work Zone Speed 35 mph or Less)

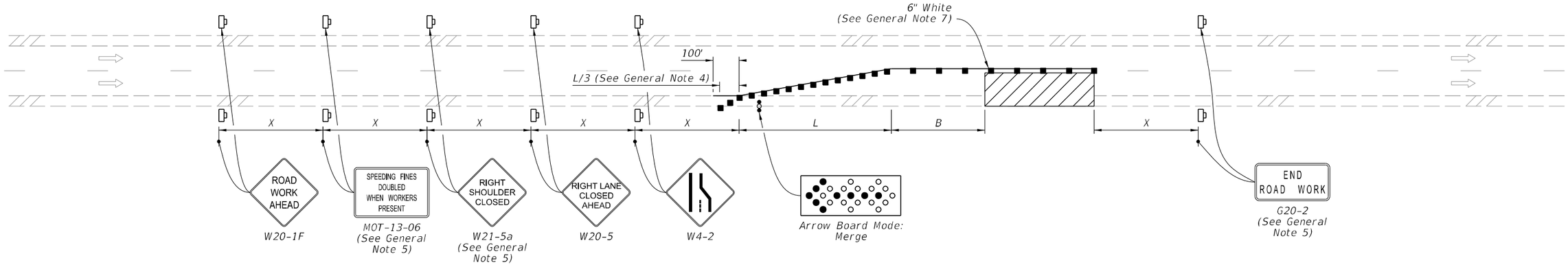


PEDESTRIAN SPECIAL DETOUR

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

9/21/2021 12:26:55 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	SIDEWALK CLOSURE	INDEX	SHEET
11/01/21						102-660	2 of 2



SINGLE LANE CLOSURE

SYMBOLS:

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Arrow Board
- Lane Identification and Direction of Traffic

GENERAL NOTE:

1. L = Taper Length
   B = Buffer Length
   X = Work Zone Sign Distance
   See Index 102-600 for "L", "B", "X", and channelizing device spacing values.

2. On undivided highways the median signs as shown are to be omitted.

3. On limited access facilities, omit "Right Shoulder Closed" signs (W21-5a) and associated work zone sign spacing distances.

4. If the paved shoulder is less than 4' in width, omit the taper and channelizing devices from the paved shoulder.

5. The "Speeding Fines Doubled When Workers Present" signs (MOT-13-06) and "End Road Work" signs (G20-2) and "Right Shoulder Closed" (W21-5a), along with associated work zone sign distances, may be omitted when the work operation will be in place for 24 hours or less. For Single Lane Closures, arrow boards and buffer (B) may also be omitted when the work operation will be in place for 60 minutes or less and the speed limit is 45 mph or less.

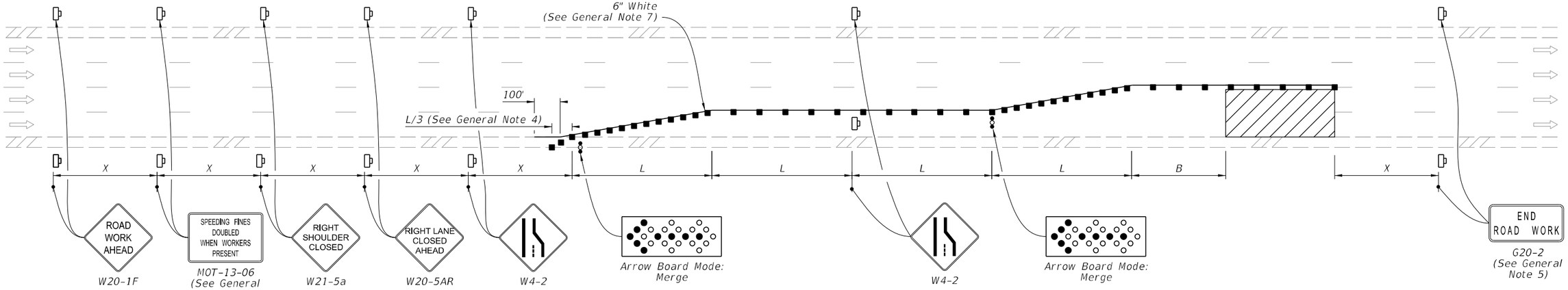
6. Use inverted plan of the illustrations for work on left side of roadways.

7. Temporary pavement markings may be omitted when the work operation is in place for 3 days or less.

12/16/2021 7:13:18 AM

Approved
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James A. Meyer
11/6/2023

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	MULTILANE ROADWAY, LANE CLOSURES	INDEX	SHEET
11/01/21						102-613	1 of 5



DOUBLE LANE CLOSURE

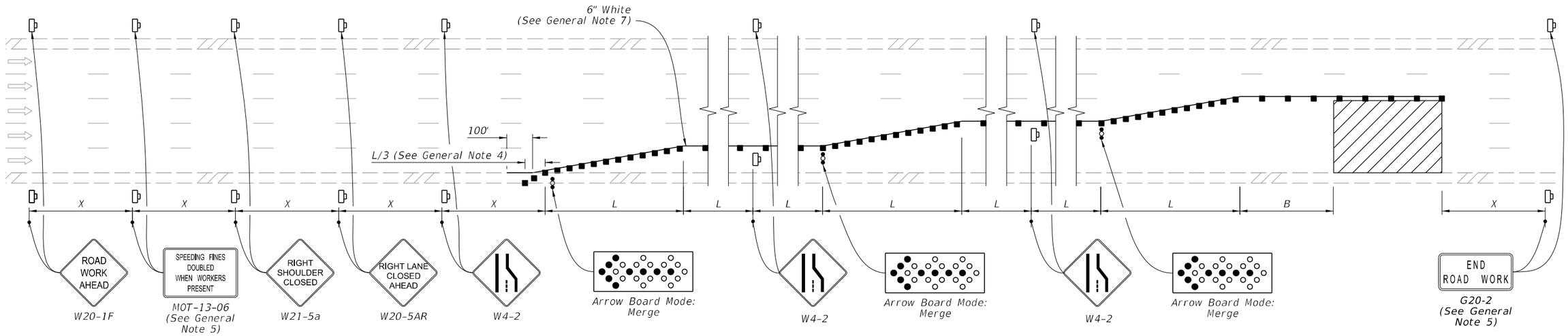
SYMBOLS:

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Arrow Board
- Lane Identification and Direction of Traffic

12/16/2021 7:13:19 AM

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2023-H-798-00197
James A. Meyer
11/6/2023

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2022-23 STANDARD PLANS	MULTILANE ROADWAY, LANE CLOSURES	INDEX	SHEET
11/01/20					102-613	2 of 5



TRIPLE LANE CLOSURE

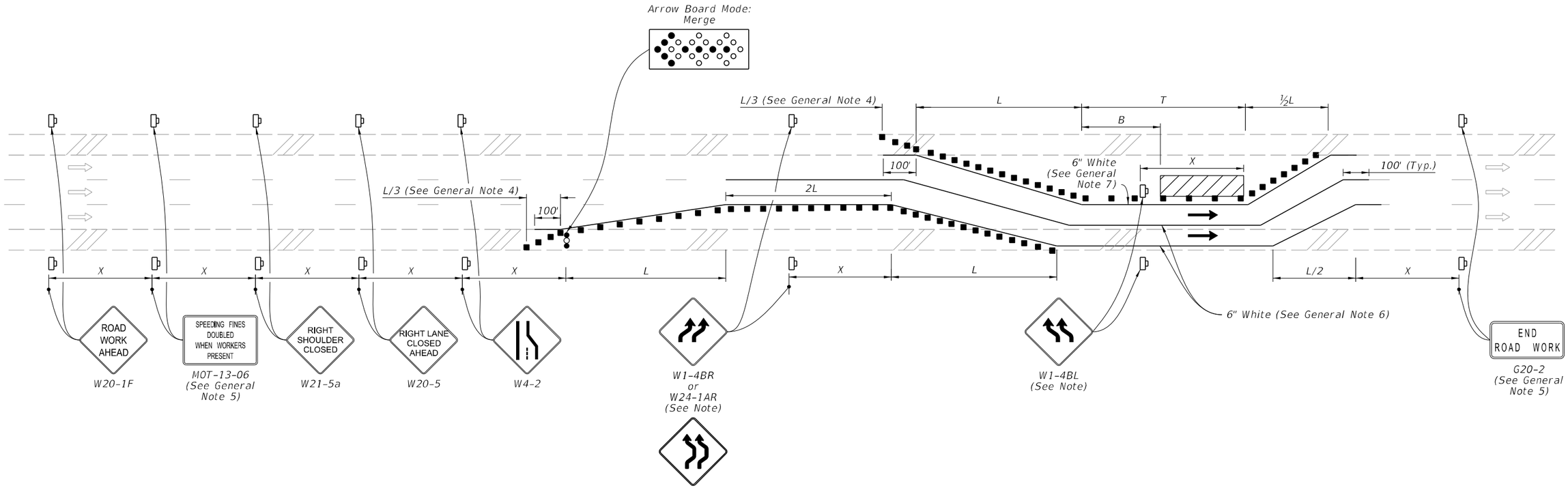
SYMBOLS:

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Arrow Board
- Lane Identification and Direction of Traffic

12/16/2021 7:13:19 AM

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2023-H-798-00197
James A. Meyer
11/6/2023

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2022-23 STANDARD PLANS	MULTILANE ROADWAY, LANE CLOSURES	INDEX	SHEET
11/01/20					102-613	3 of 5



LANE CLOSURE WITH LANE SHIFT

NOTE:

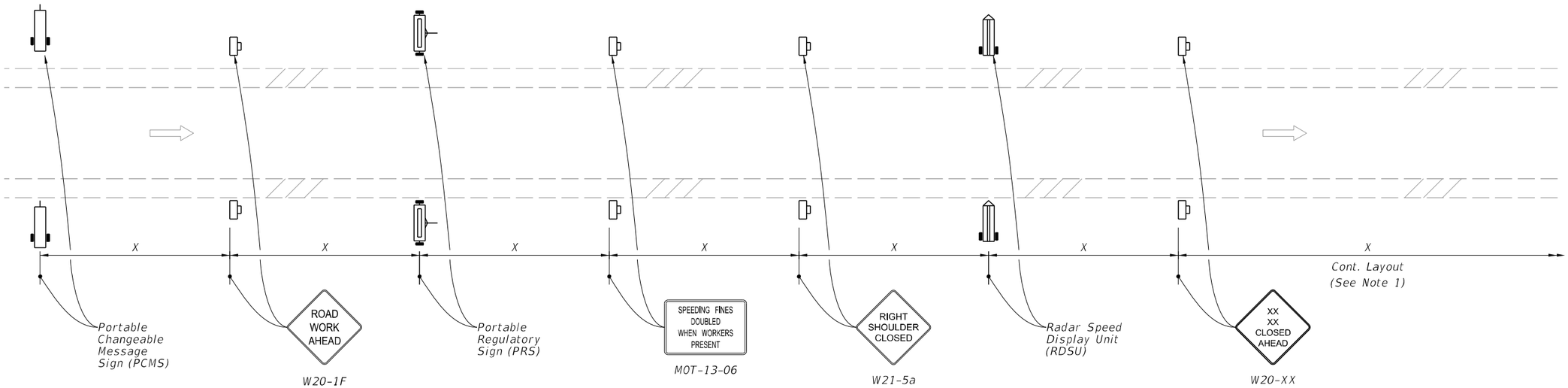
If the tangent distance "T" is less than 600', then use "Double Reverse Curve" signs (W24-1A) instead of the first pair of "Reverse Curve" signs (W1-4B) and omit the second pair of "Reverse Curve" signs.

SYMBOLS:

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Arrow Board
- Lane Identification and Direction of Traffic

12/16/2021 7:13:20 AM

Approved
2023-H-798-00197
James A. Meyer
11/6/2023



MOTORIST AWARENESS SYSTEM

SYMBOLS:

Work Zone Sign

(1) PCMS= Portable Changeable (Variable) Message Sign

(2) PRS= Portable Regulatory Sign-Speed Limit When Flashing

(2) RSDU= Radar Speed Display Unit

Lane Identification and Direction of Traffic

NOTES:

1. Use the Motorist Awareness System (MAS) for lane closures of at least 5 days (consecutive or not) on multilane divided facilities with a posted speed of 55 or greater when workers are present and not protected by a barrier.

2. Locate the Motorist MAS devices (i.e., PCMS, PRS, and RDSU) within the advance warning signs as shown. Continue with the remainder of the work zone signs and devices in accordance with the Plans or Standard Plans after the appropriate "Lane Closed Ahead" (W20-XX) sign.

3. For a posted speed of 65 mph or greater, display speed with a ten mph reduction. For a posted speed of 60 mph, display a reduced speed of 55 mph. For areas outside of the lane closure, use the posted speed as the work zone speed.

4. Omit the PCMS in the median for roadways with three lanes or less in the same direction of traffic.

TYPICAL PCMS DISPLAY:

With speed reduction:
Message 1: WORKERS PRESENT AHEAD
Message 2: SPEED REDUCED NEXT XXMI

Without speed reduction:
Message 1: WORKERS PRESENT AHEAD
Message 2: NEXT XX MILES

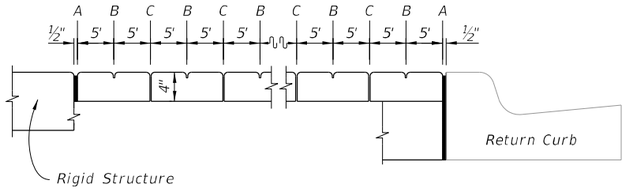
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James A. Meyer
11/6/2023

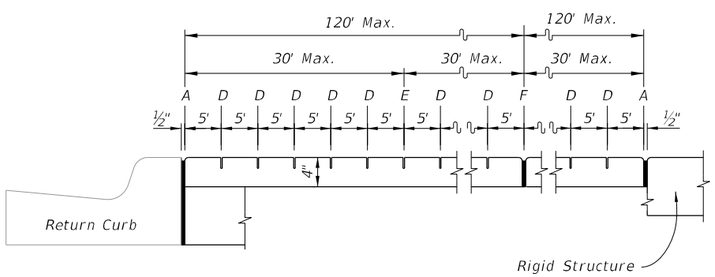
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/21			FY 2022-23 STANDARD PLANS	MULTILANE ROADWAY, LANE CLOSURES	102-613	5 of 5

GENERAL NOTES:

1. Construct sidewalks in accordance with Specification 522. Use 6" concrete for Sidewalks and Curb Ramps Located within Curb Returns (See Plan View). Install all other concrete with thickness as shown, unless otherwise detailed in the Plans.
2. Include detectable warnings on sidewalk curb ramps in accordance with Index 522-002.
3. For Driveways see Index 522-003.
4. Bond breaker material can be any impermeable coated or sheet membrane or preformed material having a thickness of not less than 6 mils and not more than ½".
5. Construct sidewalks with Edge Beam through the limits of any surface mounted Pedestrian/Bicycle Railing or Pipe Guiderail shown in the plans. (See RAILING DETAIL)



OPEN JOINTS



SAWED JOINTS

LONGITUDINAL SECTION

LEGEND:

A- ½" Expansion Joints (Preformed Joint Filler) between the sidewalk and; driveways, sidewalk-intersections, and all other fixed objects (e.g. drainage inlets and utility poles).

B- ⅛" Dummy Joints, Tooled

C- ⅛" Formed Open Joints

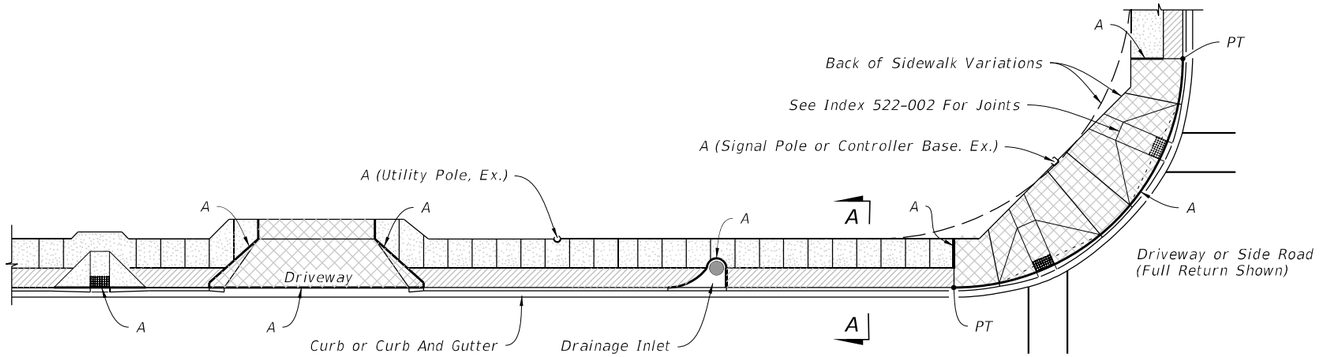
D- 3/16" Saw Cut Joints, 1½" Deep (within 96 hours) Max. 5' Centers

E- 3/16" Saw Cut Joints, 1½" Deep (within 12 hours) Max. 30' Centers Joint(s) Required When Length Exceeds 30'

F- ½" Expansion Joint When Run Of Sidewalk Exceeds 120'. Intermediate locations when called for in the plans or at locations as directed by the Engineer.

G- Cold Joint With Bond Breaker, Tooled

SIDEWALK JOINTS

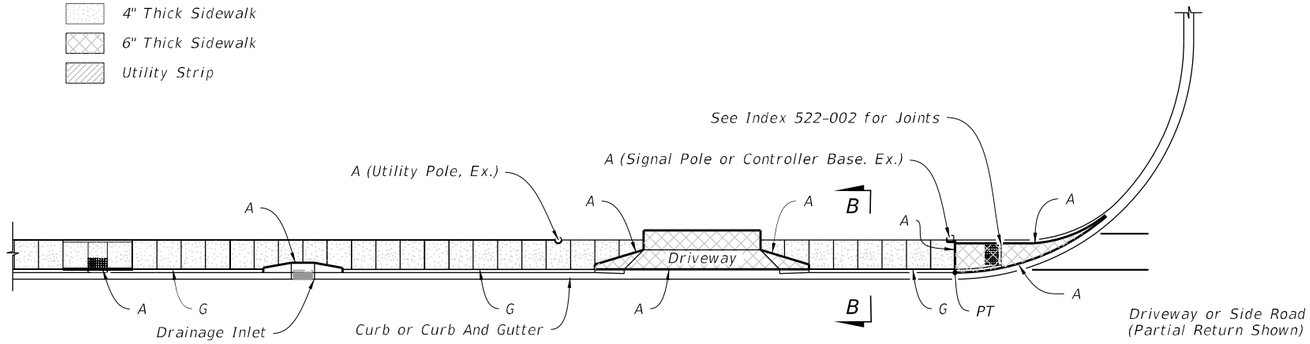


PLAN

SIDEWALK WITH UTILITY STRIP

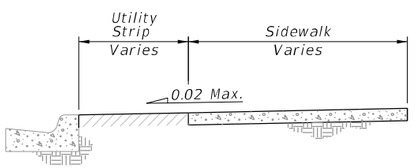
LEGEND:

- 4" Thick Sidewalk
- 6" Thick Sidewalk
- Utility Strip

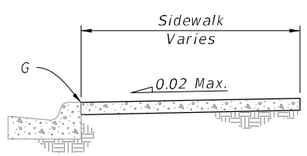


PLAN

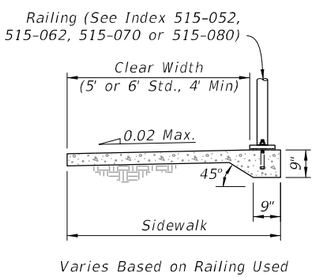
SIDEWALK WITHOUT UTILITY STRIP



SECTION A-A



SECTION B-B



Varies Based on Railing Used

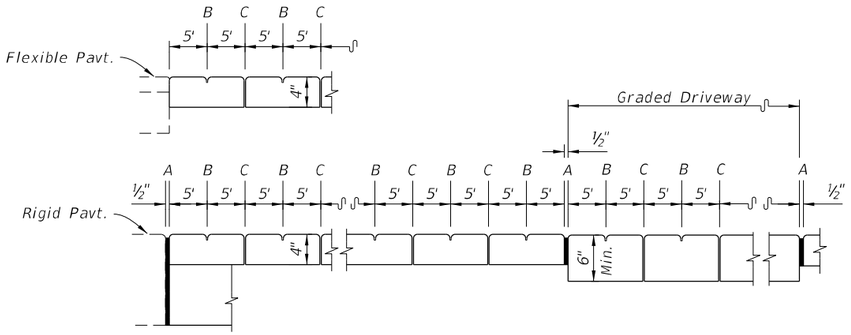
RAILING DETAIL

GENERAL NOTES AND CONCRETE SIDEWALK ON CURBED ROADWAYS

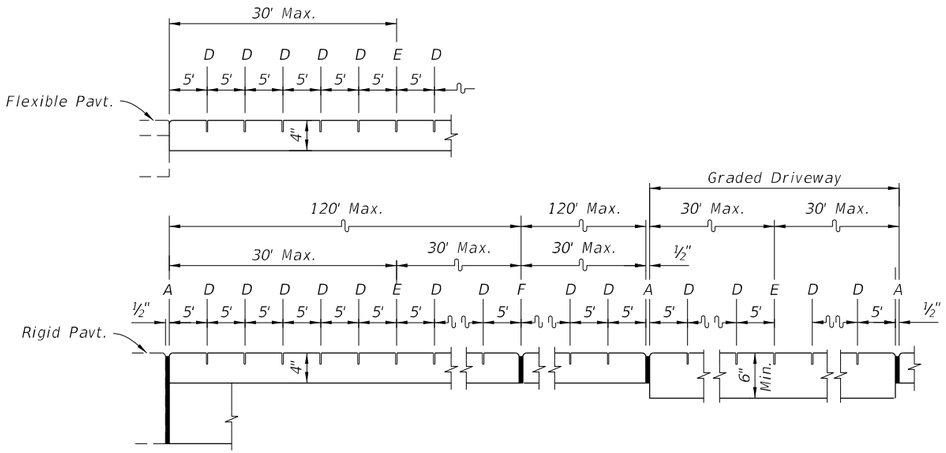
LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2022-23 STANDARD PLANS	CONCRETE SIDEWALK	INDEX	SHEET
11/01/18					522-001	1 of 2

3/9/2022 7:30:30 AM

Approved
2023.11.06 10:30:19 -05'00'
James A. Meyer
11/6/2023



OPEN JOINTS



SAWED JOINTS

LONGITUDINAL SECTION

LEGEND:

A– ½" Expansion Joints (Preformed Joint Filler) between the sidewalk and driveways, sidewalk-intersections, and all other fixed objects (e.g. drainage inlets and utility poles).

B– ⅛" Dummy Joints, Tooled

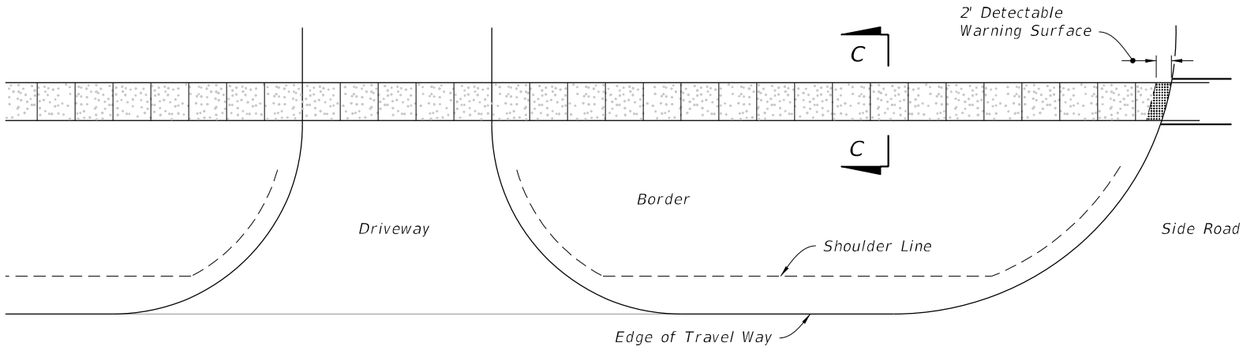
C– ⅛" Formed Open Joints

D– 3/16" Saw Cut Joints, 1½" Deep (within 96 hours) Max. 5' Centers

E– 3/16" Saw Cut Joints, 1½" Deep (within 12 hours) Max. 30' Centers
Joint(s) Required When Length Exceeds 30'

F– ½" Expansion Joint When Run Of Sidewalk Exceeds 120'. Intermediate locations when called for in the plans or at locations as directed by the Engineer.

SIDEWALK JOINTS

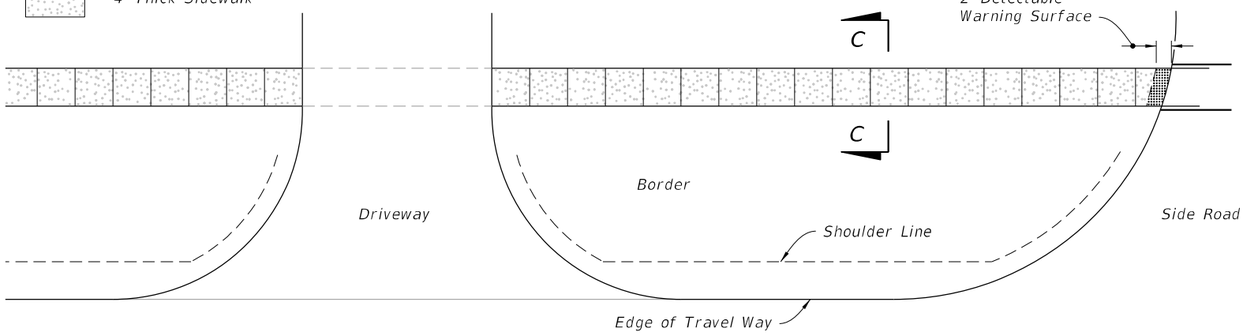


PLAN

CONTINUOUS SIDEWALK

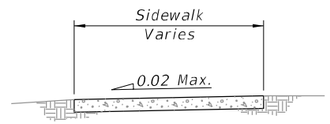
LEGEND:

4" Thick Sidewalk



PLAN

DISCONTINUOUS SIDEWALK



SECTION C-C

CONCRETE SIDEWALK ON FLUSH SHOULDER ROADWAYS

Approved
2023-H798-00197
James A. Meyer
11/6/2023

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/18			FY 2022-23 STANDARD PLANS	CONCRETE SIDEWALK	522-001	2 of 2

9/22/2021 8:49:07 AM

GENERAL NOTES:

1. Cross Slopes and Grades:

   A. Sidewalk, ramp, and landing slopes (i.e. 0.02, 0.05, and 1:12) shown in this Index are maximums. With approval of the Engineer, provide the minimum feasible slope where the requirements cannot be met.

   B. Landings must have cross-slopes less than or equal to 0.02 in any direction.

   C. Maintain a single longitudinal slope along each side of the curb ramp. Ramp slopes are not required to exceed 15 feet in length.

   D. Joints permitted at the location of Slope Breaks. Otherwise locate joints in accordance with Index 522-001. No joints are permitted within the ramp portion of the Curb Ramp.

2. Curb, Curb and Gutter and/or Sidewalk:

   A. Refer to Index 522-001 for concrete thickness and sidewalk details.

   B. Remove any existing curb, curb and gutter, or sidewalk to the nearest joint beyond the curb transition or to the extent that no remaining section is less than 5 feet long.

   C. Width of Curb Ramp is 4'-0" minimum. Match sidewalk or Shared Use Path width as shown in the Plans.

3. Curb Ramp Alpha-Identification:

   A. Sidewalk curb ramp alpha-identifications (e.g. CR-A) are provided for reference purposes in the Plans.

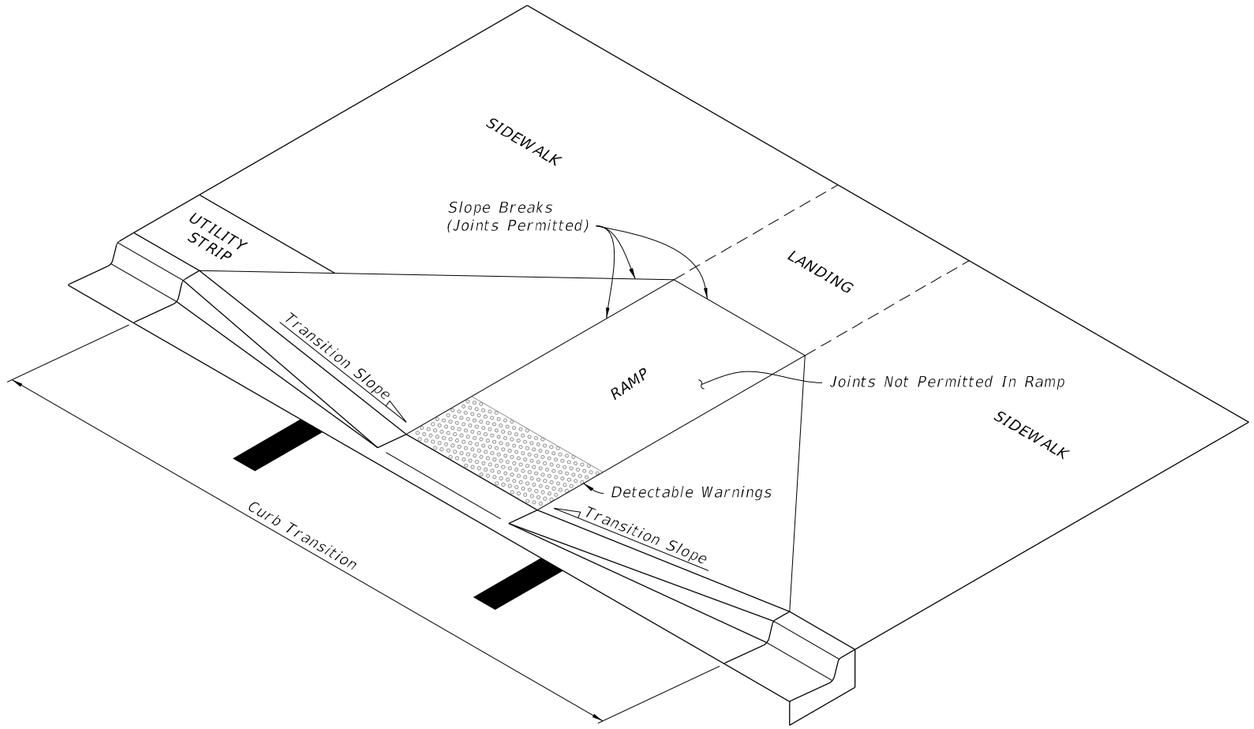
   B. Alpha-identifications CR-I and CR-J are intentionally omitted.

4. Detectable Warnings:

   A. Install detectable warnings in accordance with Specification 527.

   B. Place detectable warnings across the full width of the ramp or landing, to a minimum depth of 2 feet measured perpendicular to the curb line and no greater than 5 feet from the back of the curb or edge of pavement.

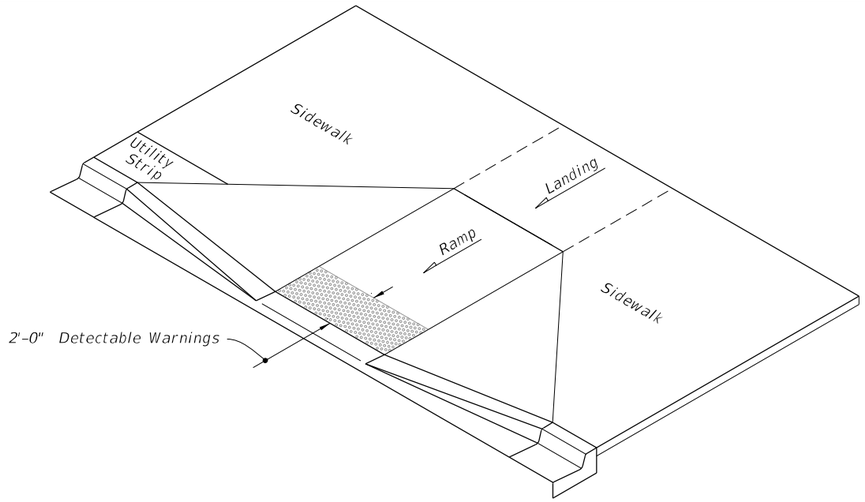
   C. If detectable warnings are shown in the Plans on slopes greater than 5%, align the truncated domes with the centerline of the ramp; otherwise, the truncated domes are not required to be aligned.



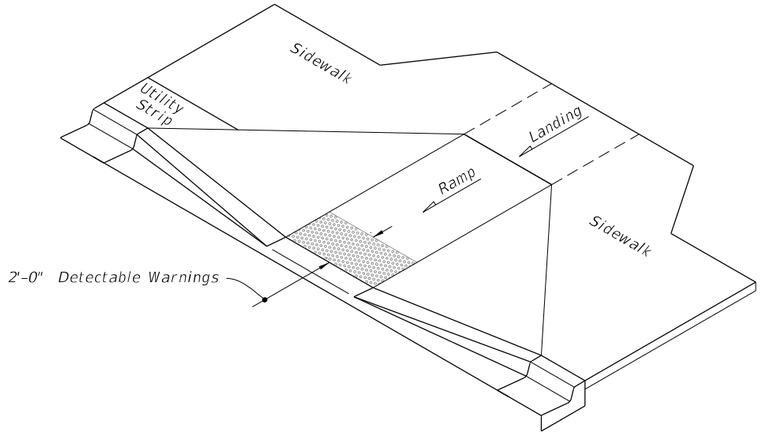
CURB RAMP NOMENCLATURE

9/22/2021 8:50:28 AM

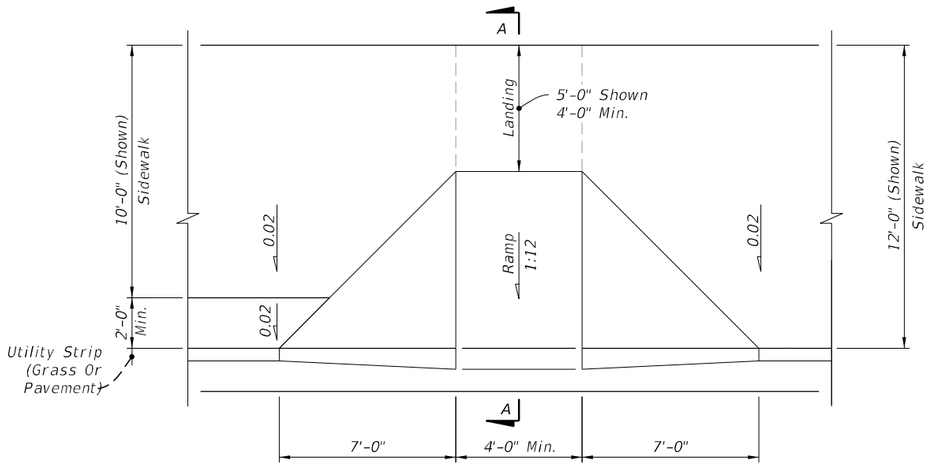
Approved
2023-H-798-00197
James A. Meyer
11/6/2023



ISOMETRIC VIEW



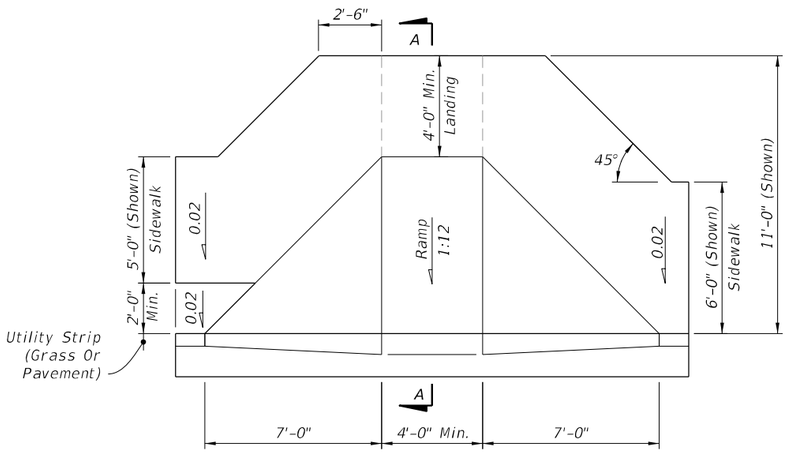
ISOMETRIC VIEW



PLAN VIEW

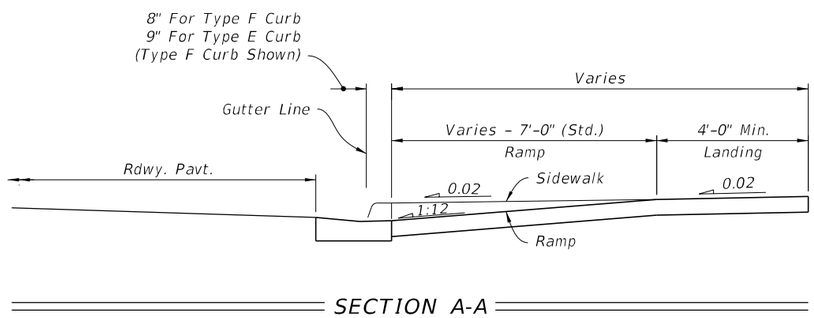
NOTE: For Example of CR-A used in Radial Curb Returns, See Sheet 8.

CR-A



PLAN VIEW

CR-B



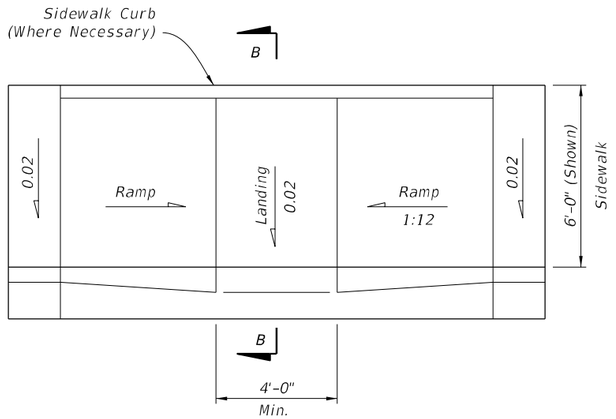
SECTION A-A

SIDEWALK CURB RAMPS CR-A AND CR-B

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

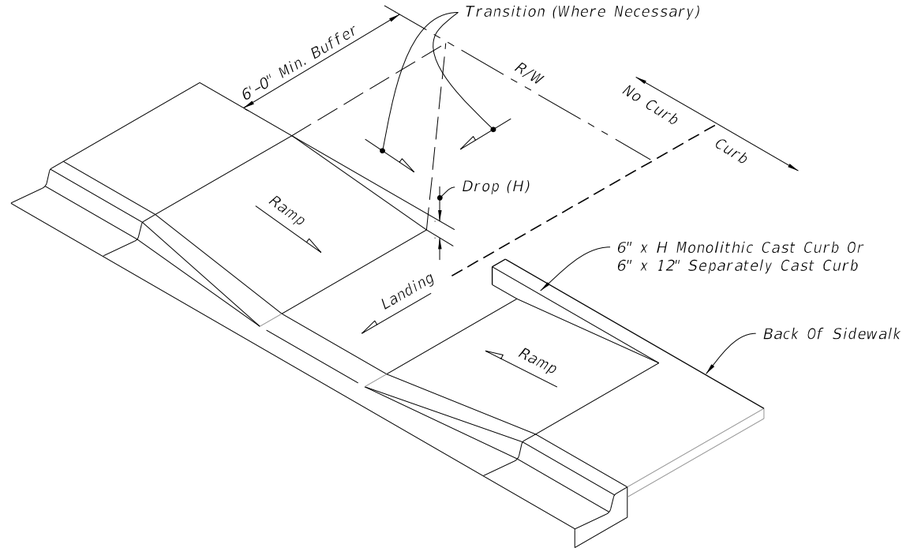
LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/20			FDOT FY 2022-23 STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	522-002	2 of 7

9/22/2021 8:50:30 AM

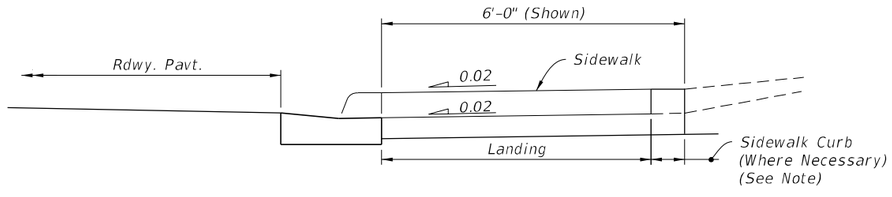


PLAN VIEW

CR-C

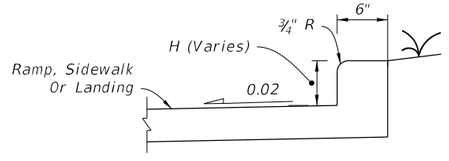


CONSTRUCTION OF SIDEWALK CURB IN CUT SECTIONS

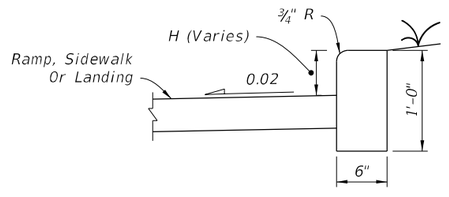


NOTE: For additional information on sidewalk curb construction, see SIDEWALK CURB OPTIONS details.

SECTION B-B



MONOLITHIC CAST CURB



SEPARATELY CAST CURB

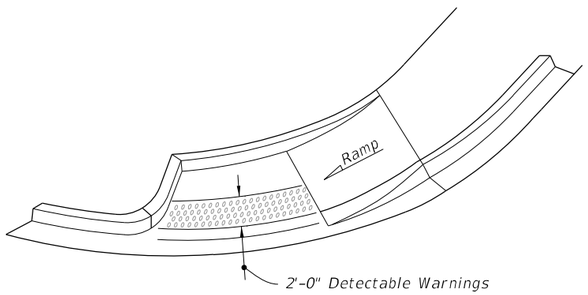
SIDEWALK CURB OPTIONS

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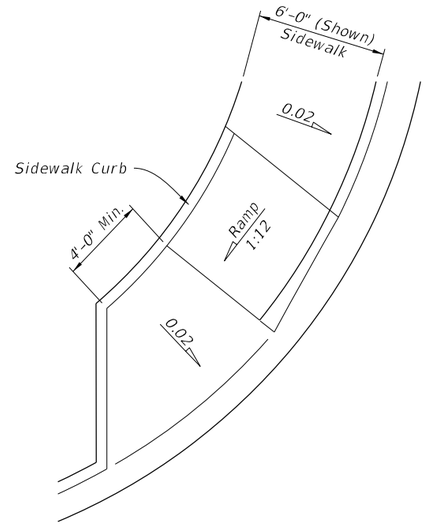
Approved
2023-H-798-00197
James A. Meyer
11/6/2023

SIDEWALK CURB RAMPS CR-C AND SIDEWALK CURB

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX	SHEET
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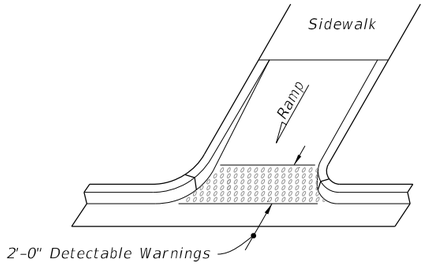


ISOMETRIC VIEW



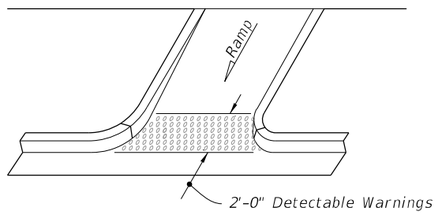
PLAN VIEW

CR-D



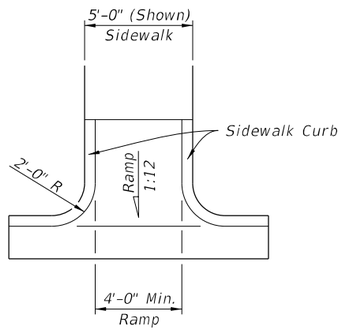
OPTION A

Sidewalk



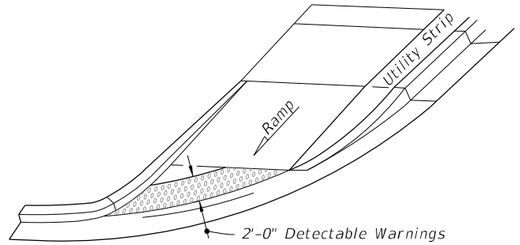
OPTION B

ISOMETRIC VIEW

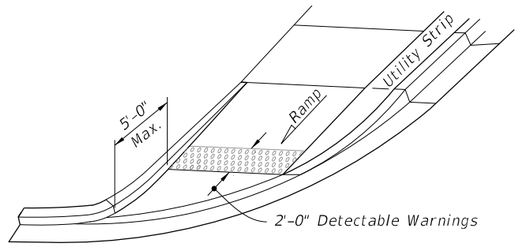


PLAN VIEW

CR-E

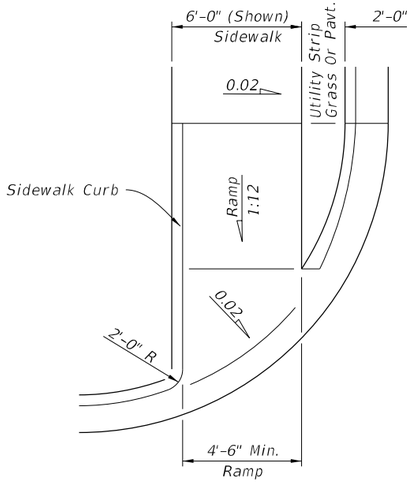


OPTION A



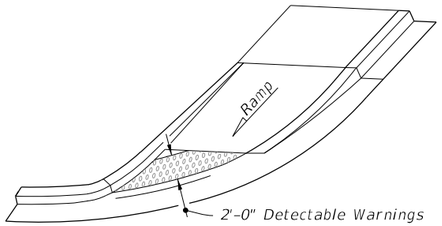
OPTION B

ISOMETRIC VIEW

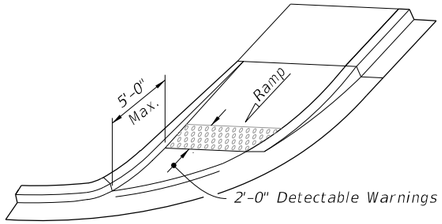


PLAN VIEW

CR-F

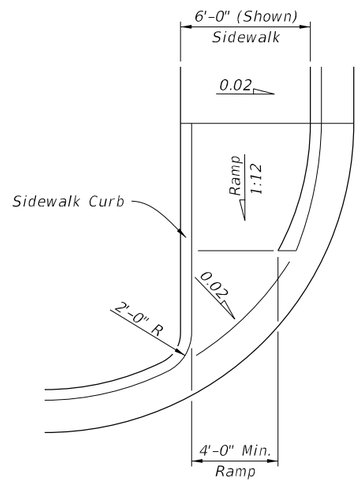


OPTION A



OPTION B

ISOMETRIC VIEW



PLAN VIEW

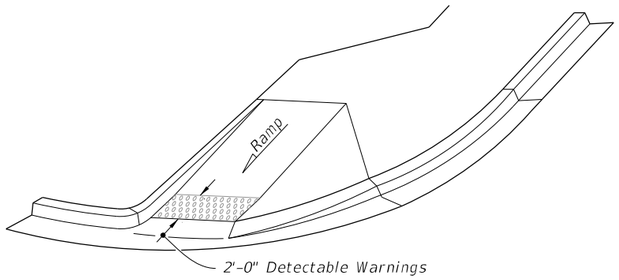
CR-G

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

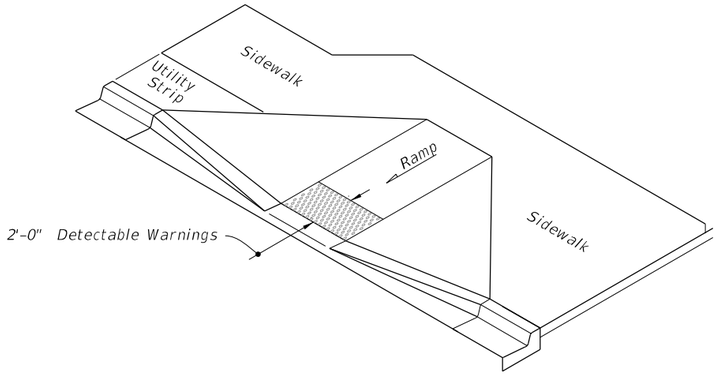
SIDEWALK CURB RAMPS CR-D, CR-E, CR-F & CR-G

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/21			FY 2022-23 STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	522-002	4 of 7

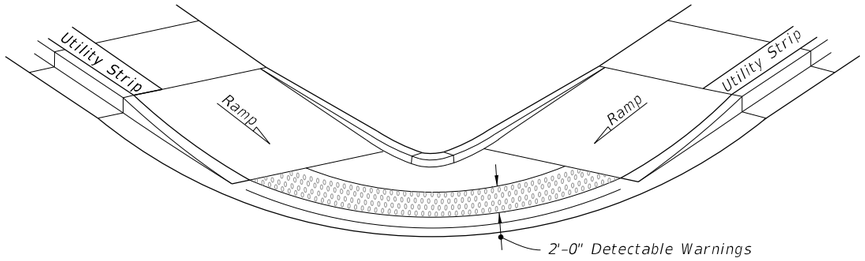
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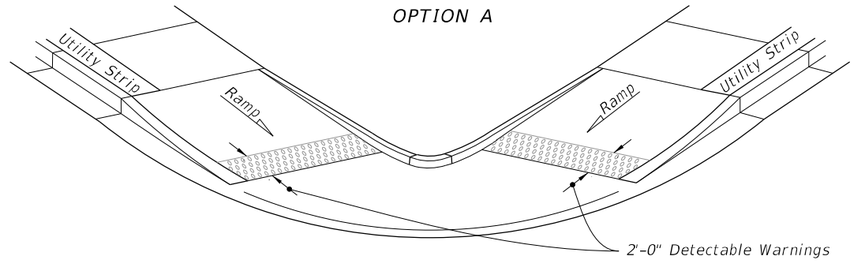
ISOMETRIC VIEW



ISOMETRIC VIEW

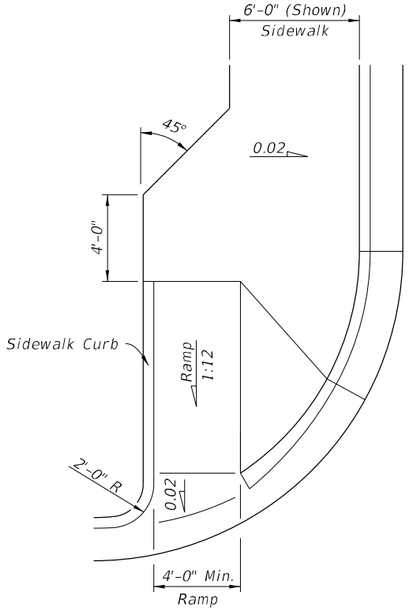


OPTION A



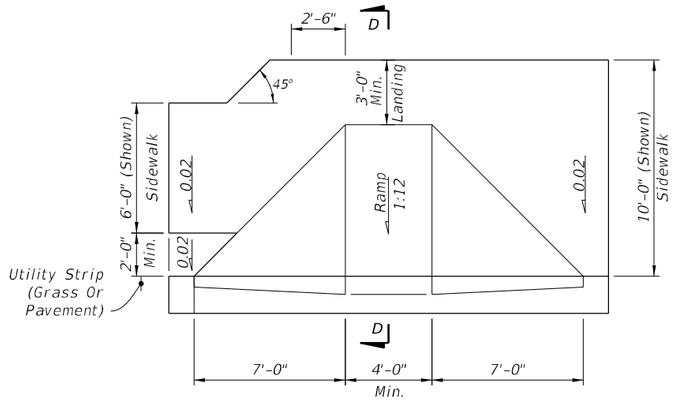
OPTION B

ISOMETRIC VIEW



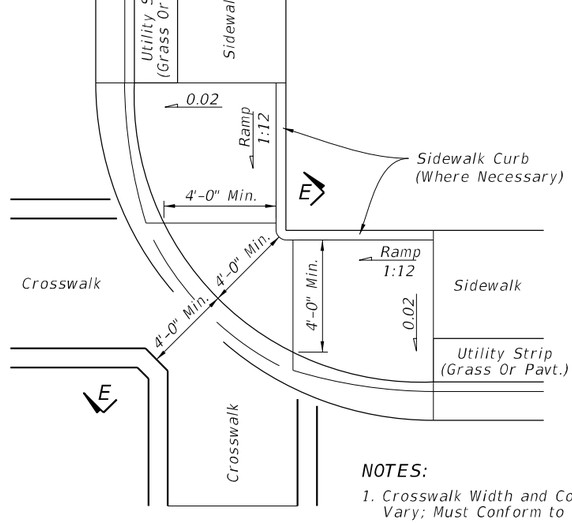
PLAN VIEW

CR-H



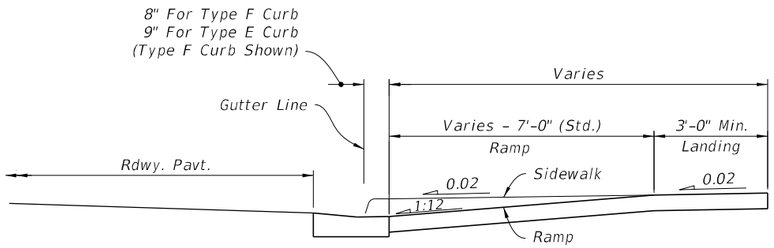
PLAN VIEW

CR-K

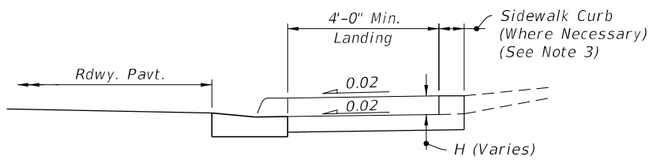


PLAN VIEW

CR-L



SECTION D-D



SECTION E-E

NOTES:

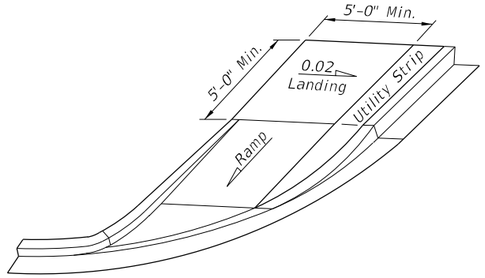
1. Crosswalk Width and Configuration Vary; Must Conform to Index 711-001.
2. 15' Radius Curve Shown for CR-L.
3. For additional information on sidewalk curb construction, see SIDEWALK CURB OPTIONS details, on Sheet 3.

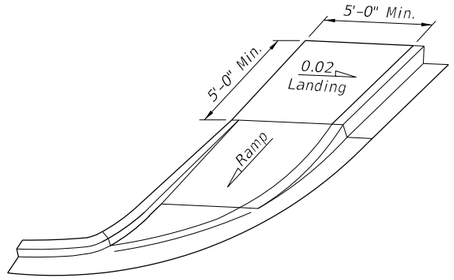
SIDEWALK CURB RAMPS CR-H, CR-K & CR-L

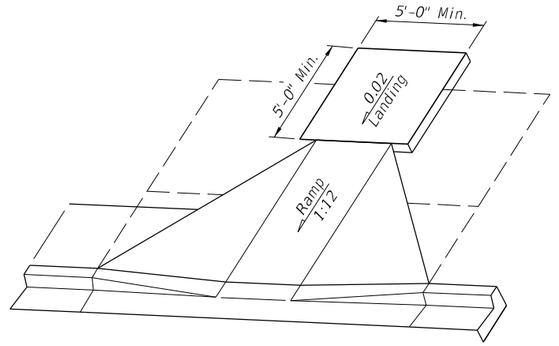
Approved
2023-H798-00197
James A. Meyer
11/6/2023

8:50:38 AM
9/22/2021

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX	SHEET
11/01/20						522-002	5 of 7

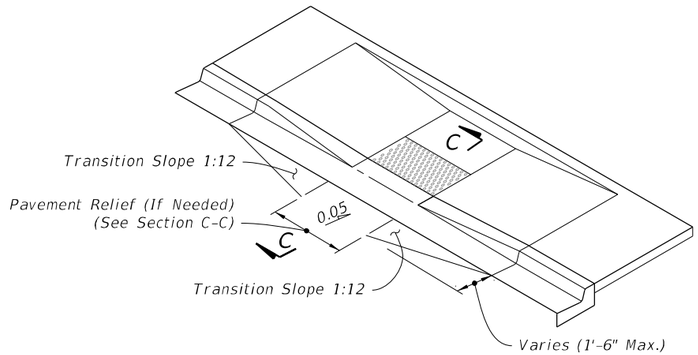






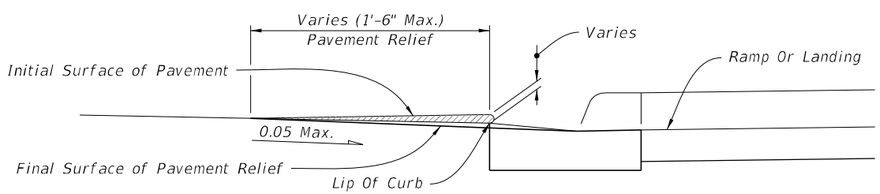
LANDINGS FOR CURB RAMPS WITHOUT SIDEWALKS

(See CR-F, CR-G & CR-K Respectively For Detectable Warning Details/Options)



ISOMETRIC VIEW

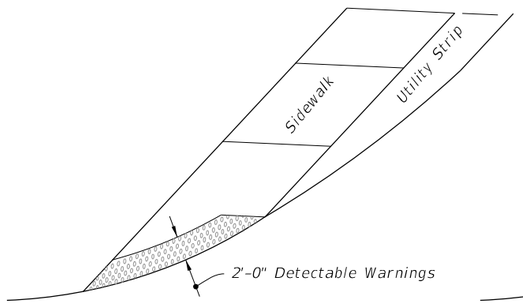
(CR-C Shown, Other Similar)



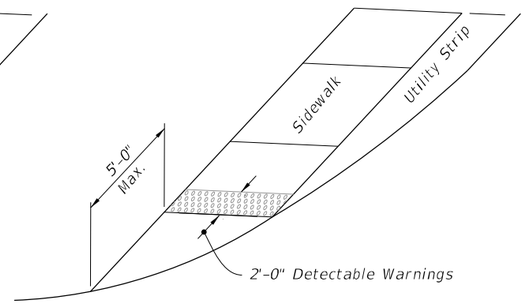
NOTE: Remove Elevated Pavement By Spading And Rolling, Smooth Milling, or Grinding.

SECTION C-C

PAVEMENT RELIEF DETAILS



OPTION A



OPTION B

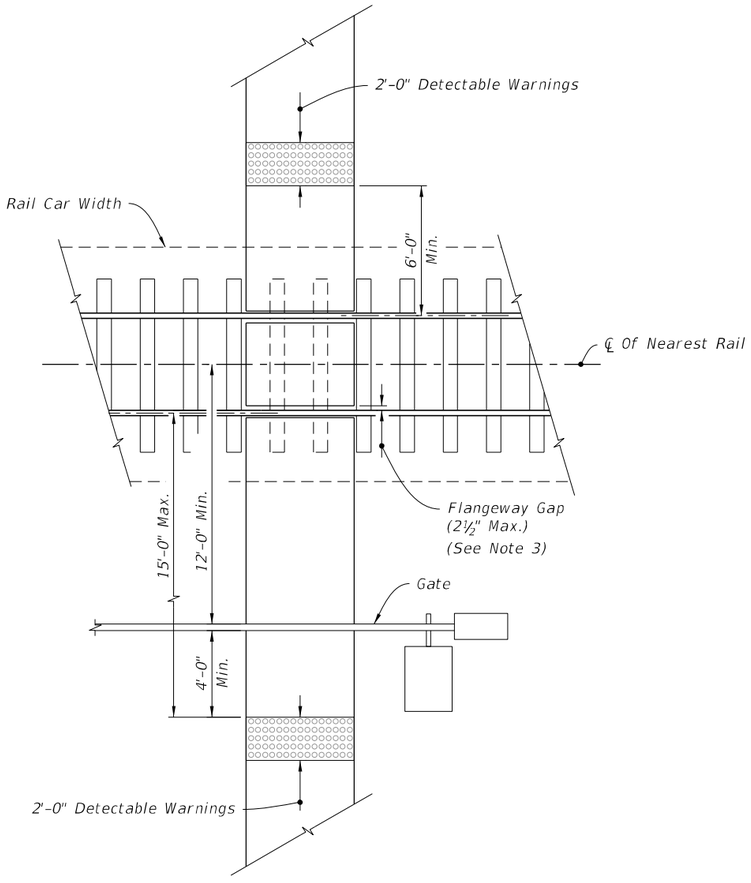
DETECTABLE WARNING ON FLUSH SHOULDER SIDEWALKS

CURB RAMPS WITHOUT SIDEWALKS AND FLUSH SHOULDER SIDEWALKS

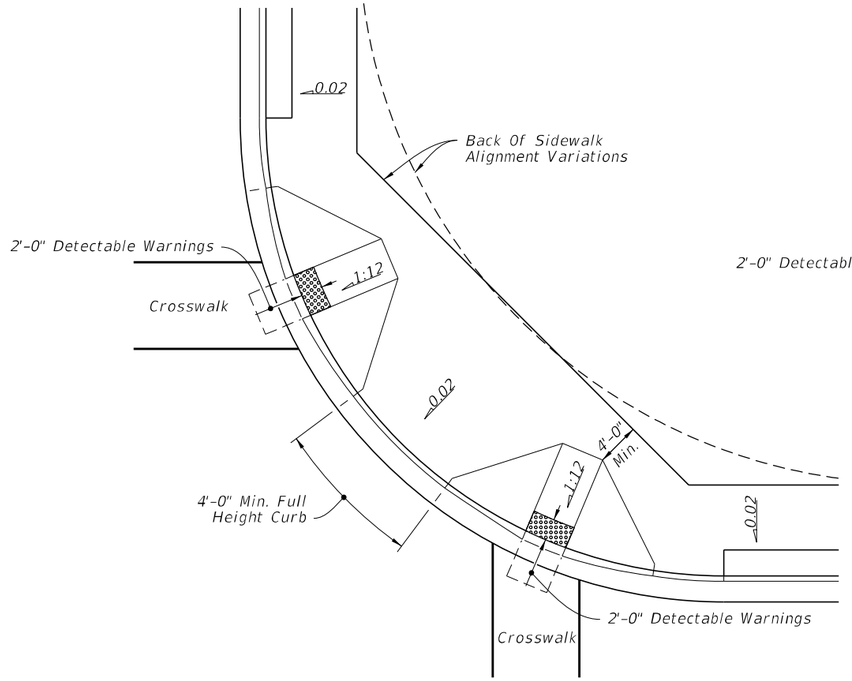
Approved
2023-H 798-00197
James A. Meyer
11/6/2023

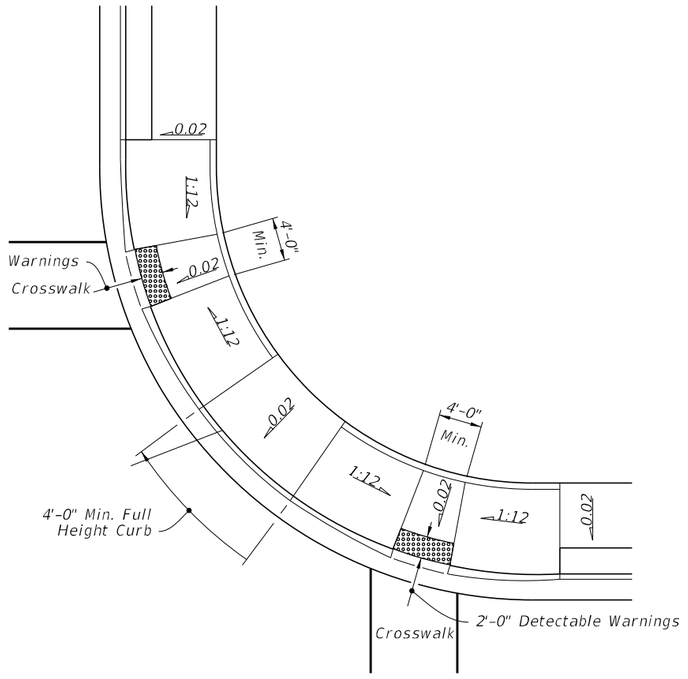
NOTES:

1. Where crosswalk markings are used, ramps must fall within the crosswalk limits. A clear space of 48" minimum is required at the bottom of the ramp within a marked crosswalk. If crosswalk markings are not present, a clear space of 48" minimum is required at the bottom of the ramp outside of active travel lanes.
2. Crosswalk widths and configurations vary; must conform to Index 711-001.
3. Flangeway Gap may be up to 3" for Freight-only Railways.

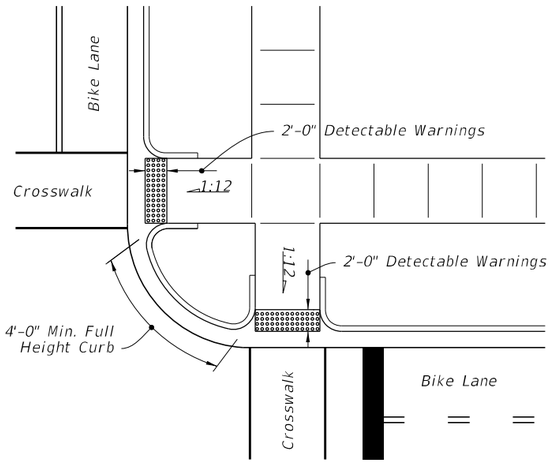


RAILROAD CROSSING

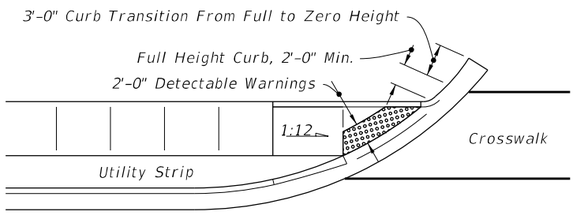




CURB RAMPS WITHIN RADIAL RETURN



CURB RAMPS OUTSIDE RADIAL RETURN



LINEAR SIDEWALK RAMPS

PLACEMENT OF SIDEWALK CURB RAMPS AT CURBED RETURNS (TYP.)

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

RAILROAD CROSSING AND CURB RAMPS AT CURBED RETURNS

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/20			FY 2022-23 STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	522-002	7 of 7

9/22/2021 8:50:43 AM

NOTE:

1. This Index applies to Two-Lane, Two-Way and Multilane Roadways, including Medians of divided roadways, with work on the shoulder.

2. L = Taper Length
   X = Work Zone Sign Spacing
   B = Buffer Length
   See Index 102-600 for "L", "X", "B", and channelizing device spacing values.

3. Where work activities are between 2' and 15' from the edge of traveled way, the Engineer may omit signs and channelizing devices for work operations 60 minutes or less.

4. When four or more work vehicles enter the through traffic lanes in a one hour period (excluding establishing and terminating the work area), use a flagger or lane closure to accommodate work vehicle ingress and egress.

5. For work less than 2' from the traveled way and work zone speed is greater than 45 MPH, use a lane closure.

6. The "Speeding Fines Doubled When Workers Present" signs (MOT-13-06) and "End Road Work" Signs (G20-2) along with the associated work zone sign spacing distances may be omitted when the work operation is in place for 24 hours or less.

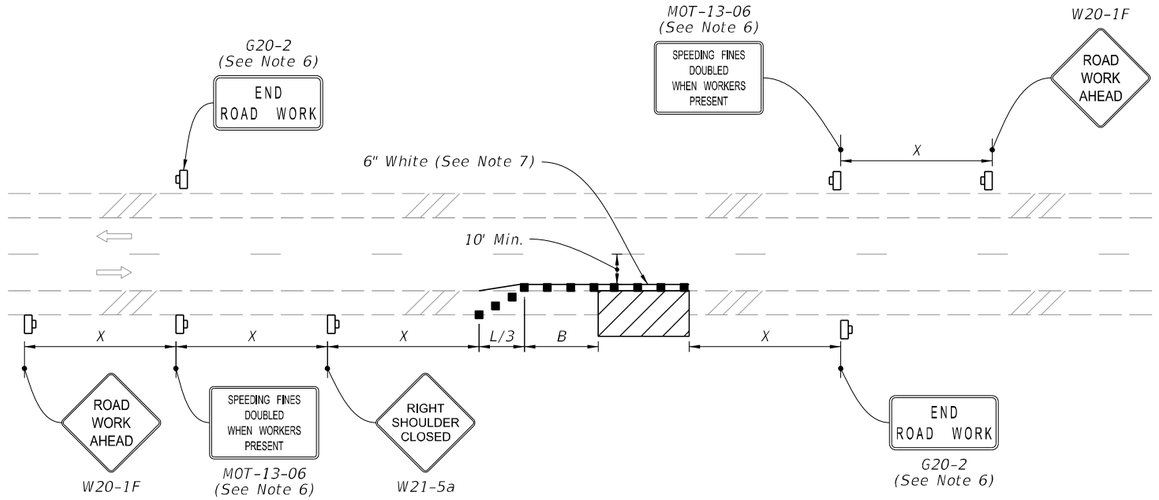
7. Temporary pavement markings may be omitted when the work operation is in place for 3 days or less.

8. Omit "Shoulder Closed" signs (W21-5a) along with associated work zone sign spacing distances for work on the median.

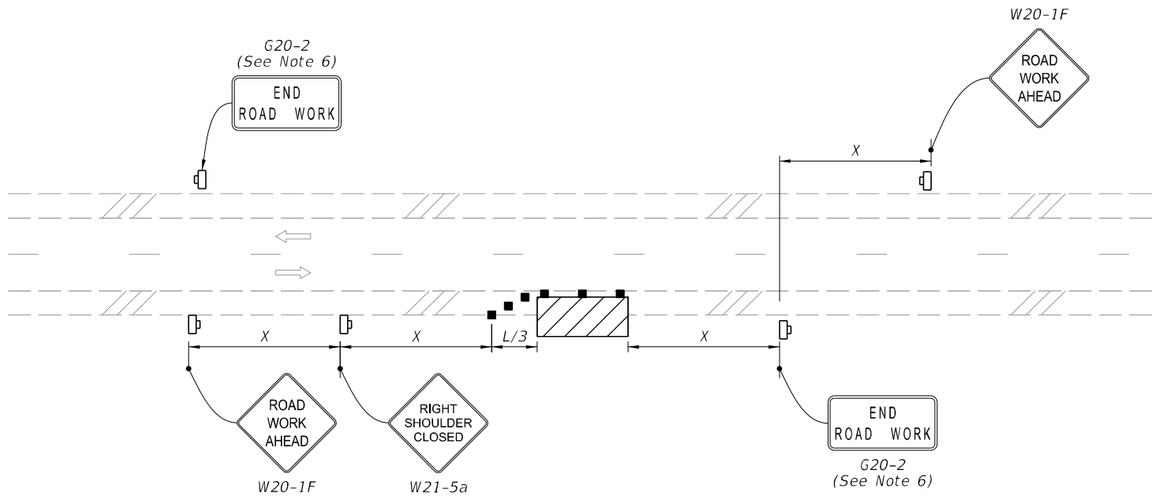
9. When there is no paved shoulder, the "Worker" sign (W21-1) may be used instead of the "Shoulder Closed" sign (W21-5a).

SYMBOLS:

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Lane Identification and Direction of Traffic



TWO-LANE ROADWAY
SHOULDER WORK LESS THAN 2' FROM THE TRAVELED WAY
WITH WORK ZONE SPEED OF 45 MPH OR LESS

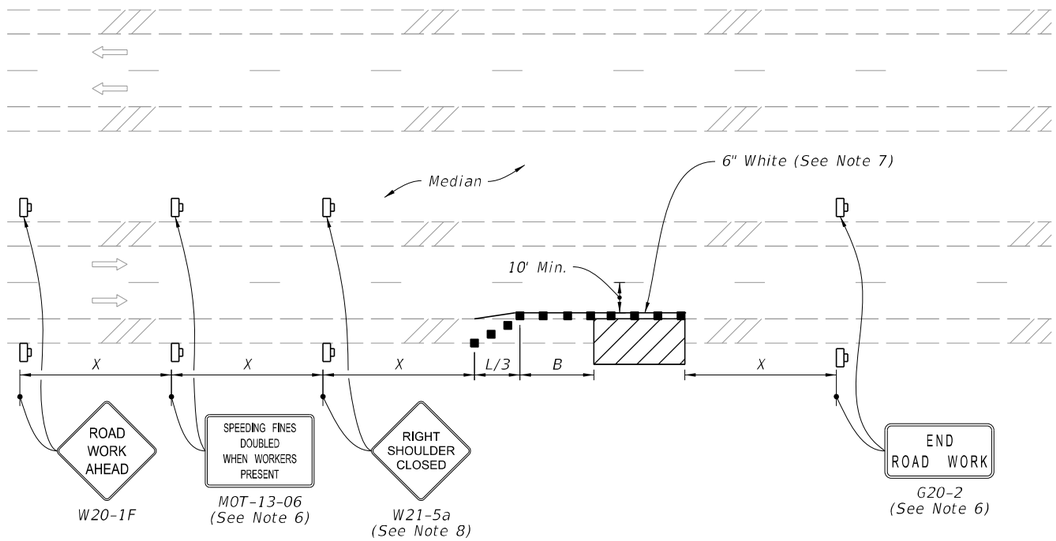


TWO-LANE ROADWAY
SHOULDER WORK BETWEEN 2' AND 15' FROM THE TRAVELED WAY

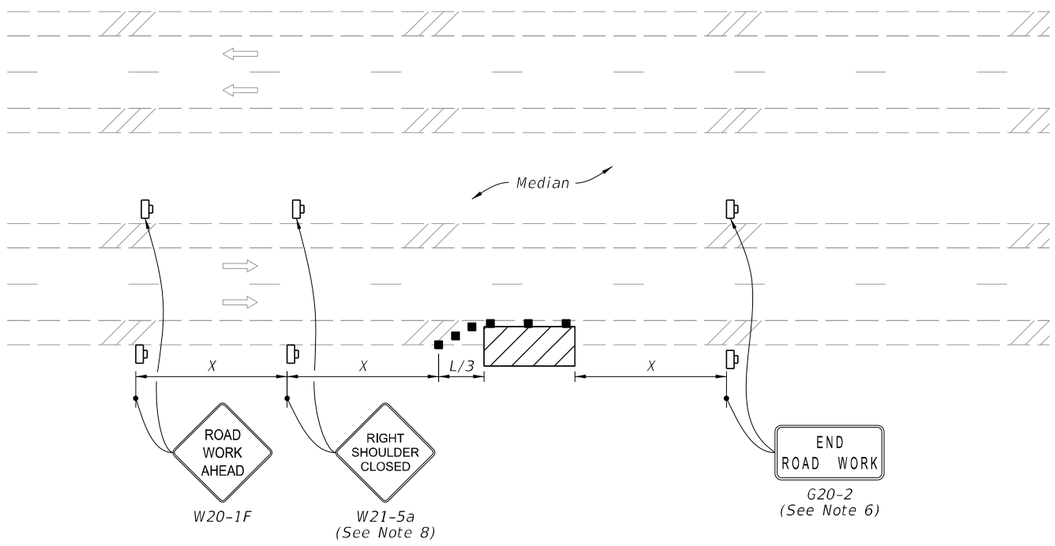
Approved
2023-H-798-00197
James A. Meyer
11/6/2023

9/23/2021 2:40:48 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	TWO-LANE AND MULTILANE, WORK ON SHOULDER	INDEX	SHEET
11/01/21						102-602	1 of 2



MULTILANE ROADWAY
SHOULDER WORK LESS THAN 2' FROM THE TRAVELED WAY
WITH WORK ZONE SPEED OF 45 MPH OR LESS



SYMBOLS:

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Lane Identification and Direction of Traffic

MULTILANE ROADWAY
SHOULDER WORK BETWEEN 2' AND 15' FROM THE TRAVELED WAY

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

9/23/2021 2:40:49 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2022-23 STANDARD PLANS	TWO-LANE AND MULTILANE, WORK ON SHOULDER	INDEX	SHEET
11/01/20					102-602	2 of 2

Florida Department of Transportation

Stormwater Pollution Prevention



Background

The National Pollutant Discharge Elimination System (NPDES) is a stormwater permitting program managed by the Florida Department of Environmental Protection (FDEP) which regulates construction activities that disturb one or more acres of land. Projects less than one acre may by regulated if the activity is part of a larger common plan of development or sale that will exceed the one acre threshold. Disturbance includes clearing, grading, and excavating.

The NPDES program also regulates municipal storm sewer systems that serve highways, area roads, and streets in your neighborhood.

Construction Requirements for Regulated Activities

- Prepare and implement a Stormwater Pollution Prevention Plan (SWPPP)
- Obtain and abide by Department of Environmental Protection (DEP) Generic Permit for Construction Activities.

For more information regarding NPDES Generic Permits for Construction Activities, please visit:
http://www.dep.state.fl.us/water/stormwater/npdes/construction1.htm

To apply using the online FDEP Business Portal, please visit:
http://www.fldepportal.com/go/apply-build/

Contacts

To report **illicit discharges**, please contact the appropriate representative listed below:

Citrus County	Citrus County BOCC – Engineering	Primary: 352-527-5446
Hernando County	Hernando County Stormwater	Primary: 352-754-4062
Hillsborough County	Hillsborough County Environmental Protection Commission	Primary: 813-627-2600 Alternate: 813-744-5671
Pasco County	Pasco County Stormwater	Primary: 727-834-3611
Pinellas County	Pinellas County Environmental Management	Primary: 727-464-4187 Alternate: 727-464-4703
FDOT Right-of-Way	District Maintenance	Primary: 813-975-6639

Environmental Protection Agency (EPA) **Spill Response Hotline: 1-800-424-8802**
For EPA spill and environmental violation information, please visit:
https://www.epa.gov/pesticide-incidents/report-spills-and-environmental-violations

Preventing Illicit Discharges & Water Pollution

Illicit Discharges are point sources of discharge which negatively impact stormwater, which eventually drains into local natural water systems. The most effective way to eliminate these discharges is to dispose of pollutants correctly. Below are common examples:

- Yard clippings & leaves
- Fertilizers and herbicides
- Pet waste
- Trash
- Used motor oil / filters
- Antifreeze/transmission fluid
- Paint
- Solvent / degreaser
- Cooking Grease





For more information on the proper disposal of wastes contact FDEP at 813-470-5700

Approved
2023H-98-00197
James A. Meyer
11/6/2023

FDEP (Water) Permit

FLORIDA DEPARTMENT OF
Environmental Protection

Southwest District Office
13051 North Telecom Parkway #101
Temple Terrace, Florida 33637-0926

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

Notification of Acceptance of Use of a General Permit

PERMITTEE:
John Bostic III, Utilities Director
City of Zephyrhills
5335 8th Street
Zephyrhills, FL 33542
jbostic@ci.zephyrhills.fl.us

Permit Number: 0082640-166-DSGP/02
Issue Date: October 18, 2023
Expiration Date: October 17, 2028
County: Pasco
Project Name: South 301 W Water and Wastewater Pipelines
Water Supplier: City of Zephyrhills
PWS ID: 651-2020

Dear Mr. Bostic:

On September 27, 2023, the Florida Department of Environmental Protection received a "*Notice of Intent to Use the General Permit for Construction of Water Main Extensions for PWSs*" [DEP Form No. 62-555.900(7)], under the provisions of Rule 62-4.530 and Chapter 62-555, Florida Administrative Code (F.A.C.). The proposed project includes the construction of approximately: 2,800 linear feet of eight-inch diameter water main pipe(s). The project is located on Gall Boulevard between Alston Avenue and Tucker Road.

Based upon the submitted Notice and accompanying documentation, this correspondence is being sent to advise that the Department does not object to the use of such general permit at this time. Please be advised that the permittee is required to abide by Rule 62-555.405, F.A.C., all applicable rules in Chapters 62-4, 62-550, 62-555, F.A.C., and the General Conditions for All General Drinking Water Permits (found in 62-4.540, F.A.C.).

All construction must be in accordance with this permit. Before commencing work on project changes for which a construction permit modification is required per 62-555.536(1), the permittee shall submit to the Department a written request for a permit modification. Each such request shall be accompanied by one copy of a revised construction permit application, the proper processing fee and one copy of either a revised preliminary design report or revised drawings, specifications and design data.

The permittee shall comply with all sampling requirements specific to this project. These requirements are attached for review and implementation.

Pursuant to Rule 62-555.345, F.A.C., the permittee shall submit a certification of construction completion [DEP Form No. 62-555.900(9)] to the Department and obtain approval, or clearance, from the Department before placing any water main extension constructed under this general permit into operation for any purpose other than disinfection or testing for leaks.

Within 30 days after the sale or legal transfer of ownership of the permitted project that has not been cleared for service in total by the Department, both the permittee and the proposed permittee shall sign and submit an application for transfer of the permit using Form 62-555.900(8), F.A.C., with the appropriate fee. The permitted construction is not authorized past the 30-day period unless the permit has been transferred.

This permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project, per Rule 62-4.030, F.A.C.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

for Shannon Herbon
Program Administrator
Permitting & Waste Cleanup Program
Southwest District

Enclosures: Clearance Requirements/Utilities Separation Requirements

cc:
Kenneth A. Fraser, PE, Jones Edmunds, KFraser@jonesedmunds.com
Marisol Alvarez, E.I., Jones Edmunds, MAlvarez@jonesedmunds.Com
K. Virgilio, Jones Edmunds, kvirgilio@jonesedmunds.com
Belinda Oliver, DEP SWD, belinda.oliver@floridadep.gov

A Civil Penalty May Be Incurred

if this project is placed into operation before obtaining a clearance from this office.

Requirements for clearance upon completion of projects are as follows:

1) **Clearance Form**
Submission of a fully completed Department of Environmental Protection (DEP) Form 62-555.900(9) *Certification of Construction Completion and Request for Clearance to Place Permitted PWS Components into Operation*.

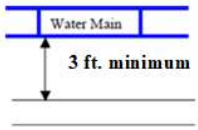
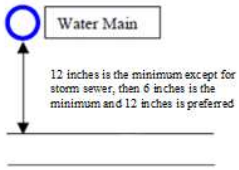
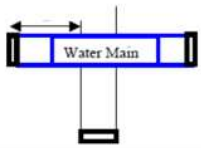
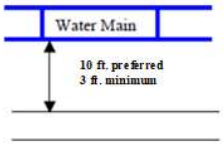
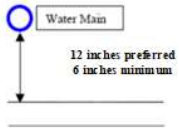
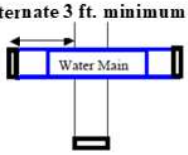
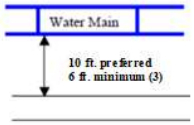
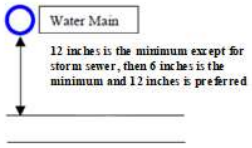
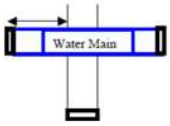
2) **Record Drawings, if deviations were made**
Submission of the portion of record drawings showing deviations from the DEP construction permit, including preliminary design report or drawings and specifications, if there are any deviations from said permit (Note that it is necessary to submit a copy of only the portion of record drawings showing deviations and not a complete set of record drawings.).

3) **Bacteriological Results**
Copies of satisfactory bacteriological analysis (a.k.a. Main Clearance), taken within sixty (60) days of completion of construction, from locations within the distribution system or water main extension to be cleared, in accordance with Rules 62-555.315(6), 62-555.320(12)(d), 62-555.350(6), 62-555.340, and 62-555.330, F.A.C. and American Water Works Association (AWWA) Standard C 651-92, as follows:

- Connection to existing system
- The end point of the proposed addition
- Any water lines branching off a main extension
- Every 1,200 feet on straight runs of pipe

Each location shall be sampled on two consecutive days, at least 6 hours apart, with sample points and chlorine residual readings clearly indicated on the report. A sketch or description of all bacteriological sampling locations must also be provided.

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH RULE 62-555.314, F.A.C.

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)			Alternate 3 ft. minimum 
Vacuum Sanitary Sewer			Alternate 3 ft. minimum 
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)			Alternate 6 ft. minimum 
On-Site Sewage Treatment & Disposal System	10 ft. minimum	---	---

(1) Water main should cross over other pipe. When water main must be below other pipe, the minimum separation is 12 inches.

(2) Reclaimed water regulated under Part III of Chapter 62-610, F.A.C.

(3) 3 ft. for gravity sanitary sewer where the bottom of the water main is laid at least 6 inches above the top of the gravity sanitary sewer.

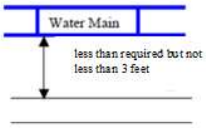
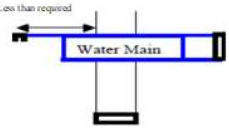
(4) Reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

EXCEPTIONS TO MINIMUM SEPARATION REQUIREMENTS

Where it is not technically feasible or economically sensible to comply with the requirements of 62-555.314(1) or (2), F.A.C., **the Department shall allow exceptions to these requirements if suppliers of water or construction permit applicants provide technical or economic justification for each exception and provide alternative construction features that afford a similar level of reliability and public health protection**.

Acceptable alternative construction features include the following:

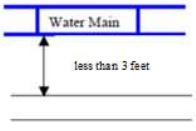
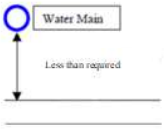
LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(a), F.A.C.

Other Pipe	Horizontal Separation	Joint Spacing @Crossings (Full Joint Centered)
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

Where an underground water main is being laid **less than the required minimum horizontal distance** from another pipeline and where an underground water main is **crossing another pipeline and joints in the water main are being located less than the required minimum distance from joints in the other pipeline**:

1. Use of pressure-rated pipe conforming to the American Water Works Association standards incorporated into Rule 62- 555.330, F.A.C., for the other pipeline if it is a gravity- or vacuum-type pipeline;
2. Use of welded, fused, or otherwise restrained joints for either the water main or the other pipeline; **or**
3. Use of watertight casing pipe or concrete encasement at least four inches thick for either the water main or the other pipeline.

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(b), F.A.C.

Other Pipe	Horizontal Separation	Crossings
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

Where an underground water main is being laid **less than three feet horizontally** from another pipeline and where an underground water main is **crossing another pipeline and is being laid less than the required minimum vertical distance from the other pipeline**:
Use of pipe, or casing pipe, having high impact strength (i.e., having an impact strength at least equal to that of 0.25-inch-thick ductile iron pipe) or concrete encasement at least four inches thick for both the water main **and** for the other pipeline if it is new and is conveying wastewater or reclaimed water.

Disclaimer – This document is provided for your convenience only. Please refer to Rule 62-555.314, F.A.C., for additional construction requirements.

FDEP (Wastewater) Permit

FLORIDA DEPARTMENT OF Environmental Protection

Southwest District Office
13051 North Telecom Parkway #101
Temple Terrace, Florida 33637-0926

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

October 12, 2023

PERMITTEE:
John Bostic III, Utilities Director
City of Zephyrhills
5335 8th Street
Zephyrhills, FL 33542
jbostic@ci.zephyrhills.fl.us

PERMIT NUMBER:	CS51-0030492-126-DWC/CG
ISSUE DATE:	October 12, 2023
EXPIRATION DATE:	October 11, 2028
COUNTY:	Pasco
PROJECT NAME:	South 301 W Water and Wastewater Pipelines
WWTF NAME:	City of Zephyrhills Wastewater Treatment Plant
FACILITY ID:	FLA012744

NOTIFICATION OF ACCEPTANCE OF USE OF A GENERAL PERMIT

Dear Mr. Bostic,

This letter acknowledges receipt of your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System for the subject project. Our Office received the Notice on September 27, 2023.

This is to advise you that the Department does not object to your use of this general permit for the construction of approximately: 5,800 linear feet of six-inch diameter force main pipe(s).

Please note the attached requirements apply to your use of this general permit for constructing the proposed domestic wastewater collection/transmission system.

You are further advised that the construction activity must conform to the description contained in your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System and that any deviation may subject the permittee to enforcement action and possible penalties.

If you have any questions, please contact Kieran Mannering at 813-470-5744 or via email at Kieran.Mannering@FloridaDEP.gov.

Sincerely,



_____

for Shannon Herbon
Program Administrator
Permitting & Waste Cleanup Program
Southwest District

Copies furnished to:
Kenneth Fraser, P.E., Jones Edmunds & Associates Inc., kfraser@jonesedmunds.com
Marisol Alvarez, E.I., Jones Edmunds & Associates Inc., malvarez@jonesedmunds.com
Keyla Virgilio, E.I., Jones Edmunds & Associates Inc., kvirgilio@jonesedmunds.com
Kieran Mannering, DEP SWD, kieran.mannering@floridadep.gov

REQUIREMENTS FOR USE OF THE GENERAL PERMIT FOR DOMESTIC WASTEWATER COLLECTION/TRANSMISSION SYSTEMS:

1. This general permit is subject to the general permit conditions of Rule 62-4.540, F.A.C., as applicable. This rule is available at the Department's Internet site at: https://floridadep.gov/water/water/content/water-resource-management-rules#ww *[62-4.540]*

2. This general permit does not relieve the permittee of the responsibility for obtaining a dredge and fill permit where it is required. *[62-604.600(6)(b)1]*

3. This general permit cannot be revised, except to transfer the permit. *[62-604.600(6)(b)2]*

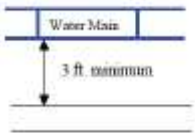
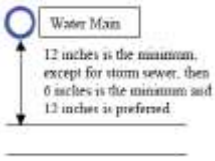
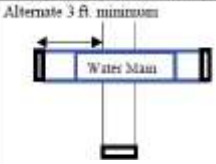
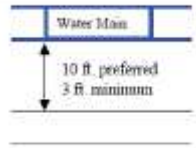
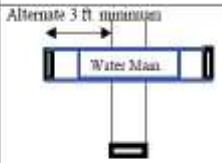
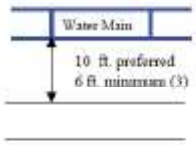
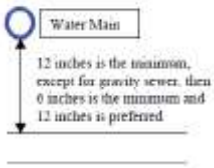
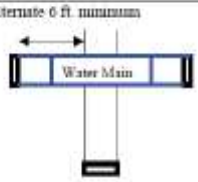
4. This general permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project. *[62-4.030]*

5. Upon completion of construction of the collection/transmission system project, and before placing the facilities into operation for any purpose other than testing for leaks or testing equipment operation, the permittee shall submit to the Department's Southwest District Office Form 62-604.300(3)(b), Request for Approval to Place a Domestic Wastewater Collection/Transmission System into Operation. This form is available at the Department's Internet site at: https://floridadep.gov/water/domestic-wastewater/content/domestic-wastewater-forms *[62-604.700(2)]*

6. The new or modified collection/transmission facilities shall not be placed into service until the Department clears the project for use. *[62-604.700(3)]*

7. Abnormal events shall be reported to the Department's Southwest District Office in accordance with Rule 62-604.550, F.A.C. For unauthorized spills of wastewater in excess of 1000 gallons per incident, or where information indicates that public health or the environment may be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER (800) 320-0519 as soon as practical, but no later than 24 hours from the time the permittee or other designee becomes aware of the circumstances. Unauthorized releases or spills less than 1000 gallons per incident are to be reported orally to the Department's Southwest District Office within 24 hours from the time the permittee, or other designee becomes aware of the circumstances. *[62-604.550]*

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH RULE 62-555.314, F.A.C.

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @ Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)			
Vacuum Sanitary Sewer			
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)			
On-Site Sewage Treatment & Disposal System	10 ft. minimum	---	---

(1) Water main should cross above other pipe. When water main must be below other pipe, the minimum separation is 12 inches.

(2) Reclaimed water regulated under Part III of Chapter 62-610, F.A.C.

(3) 3 ft. for gravity sanitary sewer where the bottom of the water main is laid at least 6 inches above the top of the gravity sanitary sewer.

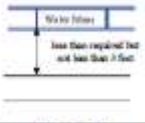
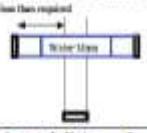
(4) Reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

EXCEPTIONS TO MINIMUM SEPARATION REQUIREMENTS

Where it is not technically feasible or economically sensible to comply with the requirements of 62-555.314(1) or (2), F.A.C., **the Department shall allow exceptions to these requirements if suppliers of water or construction permit applicants provide technical or economic justification for each exception and provide alternative construction features that afford a similar level of reliability and public health protection.**

Acceptable alternative construction features include the following:

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(a), F.A.C.

Other Pipe	Horizontal Separation	Joint Spacing @ Crossings (Full Joint Centered)
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

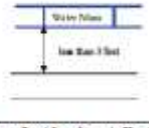
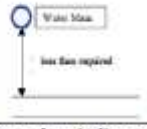
Where an underground water main is being laid **less than the required minimum horizontal distance** from another pipeline and where an underground water main is **crossing another pipeline and joints in the water main are being located less than the required minimum distance from joints in the other pipeline**:

1. Use of pressure-rated pipe conforming to the American Water Works Association standards incorporated into Rule 62-555.330, F.A.C., for the other pipeline if it is a gravity- or vacuum-type pipeline;

2. Use of welded, fused, or otherwise restrained joints for either the water main or the other pipeline; **or**

3. Use of watertight casing pipe or concrete encasement at least four inches thick for either the water main or the other pipeline.

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(b), F.A.C.

Other Pipe	Horizontal Separation	Crossings
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

Where an underground water main is being laid **less than three feet horizontally** from another pipeline and where an underground water main is **crossing another pipeline and is being laid less than the required minimum vertical distance from the other pipeline**:

Use of pipe, or casing pipe, having high impact strength (i.e., having an impact strength at least equal to that of 0.25-inch-thick ductile iron pipe) or concrete encasement at least four inches thick for both the water main **and** for the other pipeline if it is new and is conveying wastewater or reclaimed water.

Disclaimer – This document is provided for your convenience only. Please refer to Rule 62-555.314, F.A.C., for additional construction requirements.

© Jones Edmunds 2234

22x34

SOUTH 301 W
WATER AND WASTEWATER PIPELINES

CITY OF ZEPHYRHILLS, FLORIDA

PREPARED FOR:

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH ACIE FRASER, P.E. ON DATE ADJACENT TO SEAL.

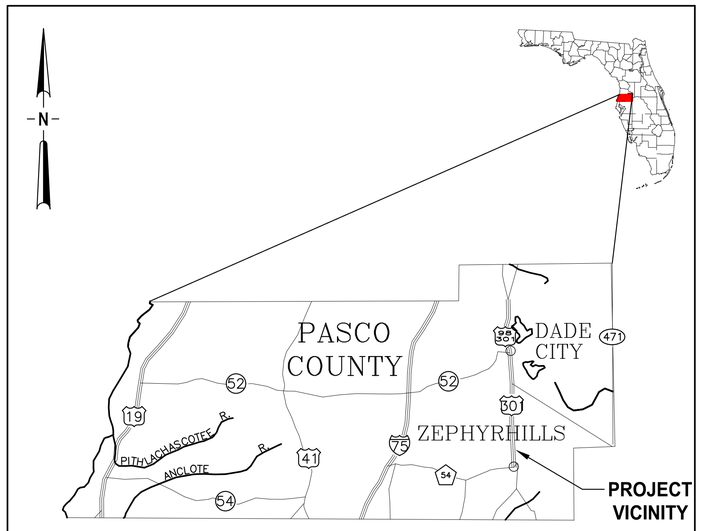
Kenneth A Fraser — Digitally signed by Kenneth A Fraser Date: 2023.11.08 13:08:06 -05'00'

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED. THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

JONES EDMUNDS
8657 BAYPINE ROAD, SUITE 300
JACKSONVILLE, FL 32256
E.O.R.: KENNETH ACIE FRASER, P.E., No. 57452

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING DIVISIONS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.:
GENERAL, CIVIL, EROSION CONTROL

KENNETH ACIE FRASER — LICENSE — No. 57452 — STATE OF FLORIDA — PROFESSIONAL ENGINEER



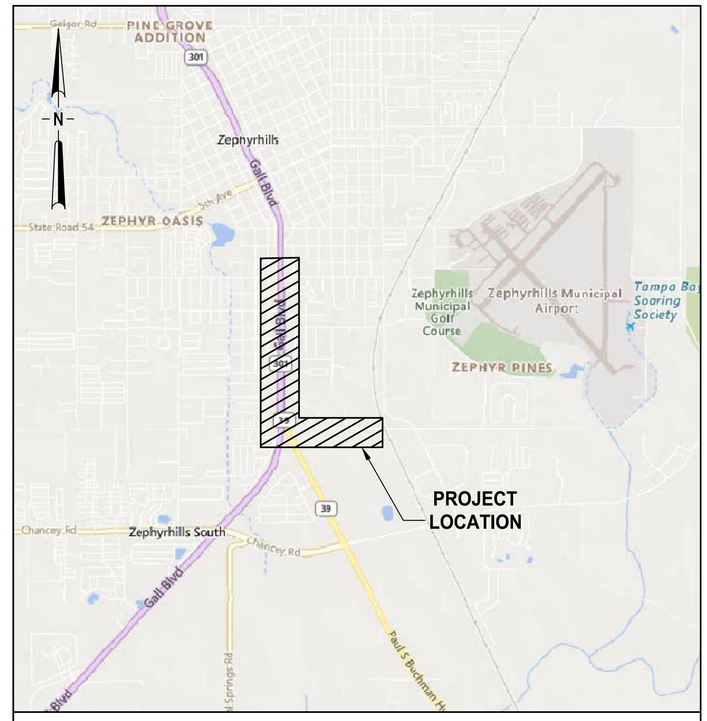
SITE VICINITY MAP

Zephyrhills
Utilities Department

PREPARED BY:

JonesEdmunds

730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
324 S. HYDE PARK AVE., SUITE 250 TAMPA, FLORIDA 33606 / (813) 258-0703



PROJECT LOCATION

PROJECT # 26110-051-01

NOVEMBER 2023

BID DOCUMENTS

LAST SAVED: 11/8/2023 10:43 AMBY:KVIRGILIO PLOTTED:11/8/2023 10:56 AMBY:KEYLA VIRGILIO, EI

PLOTTED: 11/8/2023 10:56:50 AM KEYLA VIRGILIO, EI

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GENERAL NOTES

REFERENCED DATA

1. TOPOGRAPHIC SURVEY PERFORMED BY DC JOHNSON AND ASSOCIATES, 11911 SOUTH CURLEY ST. SAN ANTONIO, FL 33576 A LICENSED PROFESSIONAL LAND SURVEYOR, DATED 3/09/2023.

2. THE SURVEY INFORMATION CONTAINED HEREIN WAS OBTAINED FOR DESIGN PURPOSES AND MAY NOT BE AN ADEQUATE REPRESENTATION OF ACTUAL CONDITIONS FOR PROJECT CONSTRUCTION. ANY EXISTING CONTOURS SHOWN REPRESENT INTERPOLATIONS/EXTRAPOLATIONS FROM THE BEST AVAILABLE SURVEY DATA. ALL RISKS RESULTING FROM THE USE OR INTERPRETATION OF THE SURVEY DATA SHOWN SHALL BE BORNE BY THE CONTRACTOR.

GENERAL

3. THE CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS AND REQUIREMENTS OF ALL PERMITS (FDEP, FDOT, PASCO COUNTY BUILDING DEPARTMENT, ETC) OBTAINED FOR THIS PROJECT.

4. THE CONTRACTOR IS ADVISED NOT TO SCALE FROM DRAWINGS BUT TO FIELD VERIFY ALL DIMENSIONS. THE DIMENSIONS OF SPECIFIED AND FURNISHED PRODUCTS AND MATERIALS TAKE PRECEDENCE OVER DIMENSIONS INDICATED ON THE DRAWINGS. IF SIGNIFICANT DEVIATIONS OCCUR, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 72 HOURS PRIOR TO CONSTRUCTION FOR A DETERMINATION AND RESOLUTION.

5. THE CONTRACTOR SHALL VERIFY THAT ALL CLEARANCES CAN BE MET. IF ANY CLEARANCES CANNOT BE MET, THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IN WRITING A MINIMUM OF 15 WORKING DAYS PRIOR TO CONSTRUCTING AND SUCH ITEM.

CONSTRUCTION LAYOUT/LIMITS OF CONSTRUCTION

6. THE CONTRACTOR SHALL OBTAIN THE SERVICES OF A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF FLORIDA FOR LAYOUT AND ESTABLISHMENT OF ELEVATIONS OF NEW WORK. PROOF OF LICENSE SHALL BE SUBMITTED TO THE ENGINEER BEFORE BEGINNING LAYOUT.

7. NO DISTURBANCE SHALL BE ALLOWED OUTSIDE OF THE RIGHT OF WAYS AND/OR THE LIMITS OF CONSTRUCTION SHOWN ON THE DRAWINGS UNLESS APPROVED BY THE OWNER OR SPECIFICALLY NOTED ON THE DRAWINGS.

EXISTING CONDITIONS

8. LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES ARE SHOWN BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE DRAWINGS BUT ARE NOT PURPORTED TO BE ABSOLUTELY CORRECT. THERE MAY BE OTHER IMPROVEMENTS, UTILITIES, ETC. WHICH ARE WITHIN THE PROJECT AREA. CONTRACTOR SHALL VERIFY, PRIOR TO CONSTRUCTION, THE LOCATIONS, ELEVATIONS, DIMENSIONS, TYPES, AND CONDITIONS OF ALL EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (WHETHER OR NOT SHOWN ON THE DRAWINGS) AFFECTING THE WORK.

9. PRIOR TO SHOP DRAWING PREPARATION AND SUBMITTAL AND PURCHASE OF RELATED MATERIALS, THE CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITIES (LOCATION, SIZE, MATERIALS OF CONSTRUCTION, OUTSIDE DIAMETER, WALL THICKNESS, ROUNDNESS, ELEVATIONS, ETC.) TO WHICH CONNECTION(S) WILL BE MADE. CONTRACTOR SHALL INCLUDE FIELD MEASUREMENTS ON SHOP DRAWINGS.

10. THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IN WRITING IMMEDIATELY IF CONFLICTS BETWEEN THE DRAWINGS AND ACTUAL CONDITIONS ARE DISCOVERED. THE CONTRACTOR SHALL ACCURATELY RECORD ANY SUCH CONFLICTS ON THE RECORD DRAWINGS.

11. ANY PROPERTY CORNERS, MONUMENTS, OR BENCH MARKS WITHIN THE PROJECT AREA SHALL BE PROTECTED UNLESS OTHERWISE INDICATED FOR DEMOLITION. IF ANY SUCH ITEMS ARE IN DANGER OF DAMAGE OR HAVE BEEN DAMAGED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER IMMEDIATELY AND REPLACE/RESTORE THESE ITEMS AT NO ADDITIONAL COST TO THE OWNER. IF OWNER CHOOSES TO SELF PERFORM THE WORK OR INCURS RELATED EXPENSES, THE CONTRACTOR SHALL REIMBURSE THE OWNER FOR ALL COSTS ASSOCIATED WITH THE EFFORT.

UTILITY COORDINATION

12. THE CONTRACTOR SHALL NOTIFY ALL UTILITIES NEAR THE PROJECT AREA AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE NOTIFYING "SUNSHINE 811 CALL OF FLORIDA" AT LEAST 48 HOURS PRIOR TO ANY DIGGING WORK TO HAVE ALL EXISTING UTILITIES LOCATED. THE PHONE NUMBER IS 1-800-432-4770 AND THE WEB SITE IS WWW.SUNSHINE811.COM, IN INSTANCES WHERE DIGGING OCCURS IN WETLANDS, THE NOTIFICATION PERIOD SHALL BE INCREASED FROM AT LEAST 48 HOURS TO AT LEAST 10 DAYS.

13. FLORIDA LAW (FS 553.851) REQUIRES THAT PERSONS MAKING EXCAVATIONS IN PUBLIC STREETS, ALLEYS, RIGHT-OF-WAYS OR UTILITY EASEMENTS MUST FIRST OBTAIN INFORMATION ON LOCATIONS OF UNDERGROUND GAS PIPELINES.

14. THE CONTRACTOR SHALL PRESERVE AND MAINTAIN EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES WITHIN THE PROJECT AREA. ANY DAMAGE SHALL BE REPAIRED BY AND AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.

15. THE CONTRACTOR IS RESPONSIBLE FOR BRACING, SHORING, OR PROVIDING OTHER MEANS NECESSARY TO PROTECT AND SUPPORT EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (EXPOSED OR UNEXPOSED) THAT MAY BE IMPACTED BY THE CONTRACTOR'S WORK.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING POWER/TELEPHONE COMPANIES AND ARRANGING TO HAVE UTILITIES POLES HELD AND/OR GUY WIRES REMOVED AND REPLACED, IF NECESSARY FOR CONSTRUCTION, AT NO ADDITIONAL COST TO THE OWNER.

SAFETY

17. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE FAMILIAR WITH THE OSHA EXCAVATION SAFETY STANDARDS AND TO ABIDE BY THEM AS COVERED UNDER THE FLORIDA TRENCH SAFETY ACT.

18. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION SAFETY.

RESTORATION

19. ALL PAVING, STABILIZED EARTH, DRIVEWAYS, CURBS, SIDEWALKS, FENCES, SOD, LANDSCAPING, CULVERTS, ETC. DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE RESTORED BY AND AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.

ACCESS/MAINTENANCE OF FACILITIES

20. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL EXISTING UTILITIES/FACILITIES AND MAINTAIN UNINTERRUPTED SERVICES THROUGHOUT THE CONTRACT PERIOD.

PIPING NOTES

21. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS. CONTRACTOR SHALL TAKE CARE TO PROVIDE PROPER GRADE ELEVATIONS AND ALIGNMENTS.

22. SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE. TYPE OF JOINT AND FITTING MATERIAL SHALL BE AS SPECIFIED FOR THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE.

23. CONTRACTOR SHALL CONSTRUCT NEW BELOW GRADE PIPING WITH A MINIMUM COVER OF 36". IF A MINIMUM COVER OF 36" CANNOT BE ACHIEVED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING.

24. CONTRACTOR SHALL INSTALL MINIMUM OF 1/4" THICK NEOPRENE PADDING BETWEEN PIPE AND SUPPORTS FOR DUCTILE IRON PIPE AND PIPE WITH COATINGS.

UTILITY SEPARATION

25. EACH PROPOSED UTILITY SHALL BE LAID TO ACHIEVE THE MINIMUM HORIZONTAL SEPARATION BETWEEN IT AND OTHER UTILITIES IN ACCORDANCE WITH THE TYPICAL UTILITY HORIZONTAL SEPARATION DETAIL AND FDEP REQUIREMENTS.

26. AT LOCATIONS WHERE A PROPOSED UTILITY CROSSES ANOTHER UTILITY, THE PROPOSED UTILITY SHALL BE INSTALLED IN ACCORDANCE WITH THE TYPICAL UTILITY CONFLICT DETAIL AND FDEP REQUIREMENTS.

27. IN THE EVENT THAT A UTILITY CONFLICT CAN NOT BE RESOLVED BY MAKING A MINOR ROUTE ADJUSTMENT OR BY UTILIZING THE TYPICAL UTILITY CONFLICT DETAIL, THE CONTRACTOR SHALL SUBMIT A RELOCATION PLAN TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCING WORK. ALL RELOCATION EFFORTS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER AND ANY AFFECTED UTILITY COMPANIES.

PROJECT SPECIFIC

28. ALL UTILITIES SHALL BE KEPT IN OPERATION EXCEPT WITH THE WRITTEN CONSENT OF THE UTILITY OWNER.

29. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING EXISTING UTILITIES AND PAVEMENT THAT THE CONTRACTOR DAMAGES DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER. REPAIRS SHALL BE CONDUCTED UNDER THE SUPERVISION OF THE OWNER AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND THESE DRAWINGS.

30. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF TWO WEEKS NOTICE TO THE OWNER PRIOR TO CONNECTING THE NEW CONSTRUCTION, EQUIPMENT, AND PIPING TO THE CITY OF ZEPHYRHILLS WWTF. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND SCHEDULING EACH CONNECTION WITH THE OWNER TO ENSURE THAT THERE ARE MINIMAL INTERRUPTIONS TO EACH SYSTEM.

31. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AND STABILIZING POWER POLES DURING CONSTRUCTION. THE CONTRACTOR SHALL CONTACT THE ELECTRIC UTILITY PROVIDER AND COORDINATE WITH THEM.

32. CONTRACTOR SHALL REMOVE TREE(S) WHEN IN DIRECT CONFLICT W/ PROPOSED WORK, AS APPROVED BY THE ENGINEER. CONTRACTOR SHALL OBTAIN PERMIT(S) REQUIRED.

33. PLEASE NOTE EXISTING UTILITIES AS SHOWN IN THE DRAWINGS ARE BASED ON AVAILABLE GIS DATA. CONTRACTOR SHALL VERIFY EXISTING UTILITIES LOCATIONS PRIOR TO CONSTRUCTION.

SPECIAL REQUIREMENTS TO HAND-DIG EXCAVATIONS FOR EXISTING UTILITY COORDINATION

34. PLEASE NOTE AREAS OF EXISTING UTILITIES IN CLOSE PROXIMITY TO THE PROPOSED INSTALLATION HAVE BEEN NOTED WITH DASHED RECTANGULAR BOXES SHOWN IN THE PLANS.

35. IN THE NOTED AREAS AND OTHER AREAS IDENTIFIED DURING CONSTRUCTION, THE CONTRACTOR SHALL HAND DIG ALL EXCAVATIONS WITHIN 10 FEET IN ALL DIRECTIONS OF A MARKED LOCATED UTILITY LINE.

36. THE CONTRACTOR SHALL ALSO HAND DIG A PILOT TRENCH WHEN CALLED FOR ON THE DIG PERMIT FOR ALL UNDERGROUND UTILITY WORK ALONG THE CENTERLINE OF NEW TRENCHES AND DOWN TO THE BOTTOM ELEVATION OF THE NEW UTILITY.

37. MACHINE EXCAVATION SHALL PROCEED ONLY AFTER IT IS DETERMINED THAT ALL EXISTING UTILITIES HAVE BEEN IDENTIFIED AND PROTECTED.

SOIL CONTAMINATION AREA

38. ONE AREA OF SOIL CONTAMINATION IS IDENTIFIED ON THE PLANS ON SHEET C8. AS A MINIMUM, THECONTRACTOR SHALL WEAR PPE WHEN WORKING IN SOIL OR GROUNDWATER IN THE AREA NOTED.

39. SOIL THAT IS DISTURBED SHALL NOT BE TAKEN OFF SITE. SOIL SHALL BE PLACED BACK WITHIN THE PROJECT BOUNDARY.

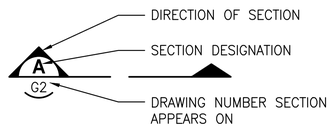
40. IN THE EVENT DEWATERING IS REQUIRED FOR THE INSTALLATION, THE CONTRACTOR SHALL CONFORM TO ENVIRONMENTAL REGULATIONS FOR THE PUMPING AND DISPOSAL OF GROUNDWATER FOR THE INSTALLATION. DEWATERING PLANS AND PERMITS SHALL INCLUDE A DETAILED SITE PLAN AND SHALL BE SUBMITTED TO THE OWNER PRIOR TO ANY WORK BEING PERFORMED IN AREAS WITH GROUNDWATER CONTAMINATION.

HORIZONTAL DIRECTIONAL DRILL NOTES

41. BORING LAYOUT BASED ON MINIMUM RADIUS OF 400 FEET. MAXIMUM BACK REAMER DIAMETERS SHALL BE
    19.8-INCH FOR 12-INCH DR-11 HDPE PIPE
    13.6-INCH FOR 6-INCH DR-11 HDPE PIPE

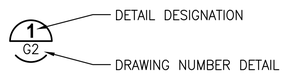
42. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNERS FOR ACCESS DURING UTILITY INSTALLATION.

43. BORE DEPTH ON BORES BENEATH FDOT ROADWAY PAVEMENT SHALL BE 10X THE BACK REAMER SIZE PER UAM 3.16.9.1.

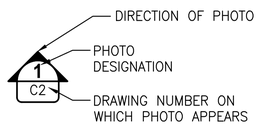


SECTION DESIGNATION





DETAIL DESIGNATION



SECTION DESIGNATION

PHOTO DESIGNATION

DRAWING INDEX

DWG. NO.	SHEET DESCRIPTION
GENERAL	
G1	COVER SHEET
G2	DRAWING INDEX, GENERAL NOTES AND DESIGNATION
G3	ABBREVIATIONS
G4	LEGENDS AND PIPE SCHEDULE
G5	SURVEY LEGEND AND NOTES
G6	KEY MAP
FORCEMAIN	
C1	FORCEMAIN PLANS
C2	FORCEMAIN PLANS
C3	FORCEMAIN PLANS
C4	FORCEMAIN PLANS
C5	FORCEMAIN PLANS
C6	FORCEMAIN PLANS
C7	FORCEMAIN PLANS
C8	FORCEMAIN PLANS
C9	FORCEMAIN PLANS
C10	FORCEMAIN PLANS
C11	FORCEMAIN PLANS
C12	FORCEMAIN PLANS
C13	FORCEMAIN PLANS
C14	FORCEMAIN PLANS
C15	FORCEMAIN PLANS
WATERMAIN	
C16	WATERMAIN PLANS
C17	WATERMAIN PLANS
C18	WATERMAIN PLANS
C19	WATERMAIN PLANS
C20	WATERMAIN PLANS
C21	WATERMAIN PLANS
C22	WATERMAIN PLANS
C23	WATERMAIN PLANS
CIVIL DETAILS	
C24	CIVIL DETAILS
C25	CIVIL DETAILS
C26	CIVIL DETAILS
C27	CIVIL DETAILS
C28	CIVIL DETAILS
C29	CIVIL DETAILS
EROSION CONTROL	
EC1	STORMWATER POLLUTION PREVENTION DETAILS
EC2	STORMWATER POLLUTION PREVENTION DETAILS
EC3	STORMWATER POLLUTION PREVENTION DETAILS

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

DRAWING INDEX, GENERAL NOTES AND DESIGNATION

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STANDARD ABBREVIATIONS

&	AND
@	AT
A	AUTOMATIC
AA STD	ALUMINUM ASSOCIATION STANDARD
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AB	ALIGNMENT BEGINNING
AC	ASBESTOS CEMENT
AC	ALTERNATING CURRENT
AC	AIR CONDITIONER
ACI	AMERICAN CONCRETE INSTITUTE
ADJ	ADJUSTABLE
AE	ALIGNMENT END
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIP	ABANDONED IN PLACE
AISI	AMERICAN IRON STEEL INSTITUTE
AIT	ANALYTICAL INDICATING TRANSMITTER
ALT	ALTERNATIVE
ALUM	ALUMINUM
AM	AUTO-MANUAL
AMPS	AMPERES
ANSI	AMERICAN NATION STANDARDS INSTITUTE
AP	ANALYZER PANEL
APP	APPROVE, APPROVED
APPROX	APPROXIMATE
AR	AIR RELEASE
ARV	AIR RELEASE VALVE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASD	ADJUSTABLE SPEED DRIVE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AVE	AVENUE
AWG	AMERICAN WIRE GUAGE
AWS	AMERICAN WELDING SOCIETY
AWWA	AMERICAN WATER WORKS ASSOCIATION
B	BORING
B/	BOTTOM OF
B/L	BASELINE OF CONSTRUCTION
BC	BARE COPPER
BF	BLIND FLANGE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BKR	BREAKER
BLD	BLIND
BLDG	BUILDING
BLVD	BOULEVARD
BM	BENCH MARK
BMP	BEST MANAGEMENT PRACTICE
BO	BLOW-OFF
BTM	BOTTOM
BTM/	BOTTOM OF
BV	BALL VALVE
BYP	BYPASS
C	CONDUIT, CONDUCTOR, CLOSE
C/L, CL	CENTERLINE
CAM	COMPUTER-AUTO-MANUAL
CAT	CATALOGUE
CB	CIRCUIT BREAKER
CC	CENTER TO CENTER
CCS	CENTRAL CONTROL SYSTEM
CF	COLUMN FOUNDATION
CFWE	CABLE FURNISHED WITH EQUIPMENT
CI	CAST IRON
CIP	CAST IN PLACE, CAST IRON PIPE
CISP	CAST IRON SLIP PIECE
CJ	CONSTRUCTION/CONTRACTION JOINT
CLF	CHAIN LINK FENCE
CLR	CLEAR
CM	COMPUTER-MANUAL
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
CO	COMPANY
COL	COLUMN
COM	COMMUNICATION
CON	CONCENTRIC
CONC	CONCRETE
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CORP	CORPORATION
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CRE	CORROSION RESISTANT
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
CS	CARBON STEEL
CT	CURRENT TRANSFORMER, CABLE TRAY CONTACTOR
CTRD	CENTERED
CV	CHECK VALVE
D	DRAIN
DB	DUCT BANK
DBI	DITCH BOTTOM INLET
DC	DIRECT CURRENT
DES	DESIGNATION
DET	DETAIL
DI	DUCTILE IRON
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DIPS	DUCTILE IRON PIPE SIZE
DIV	DIVISION
DN	DOWN, DAMPER
DR	DIMENSION RATIO
DWG	DRAWING
DXS	DOUBLE EXTRA STRONG
E	EAST(ING)
EA	EACH
ECC	ECCENTRIC
EES	EMERGENCY EYEWASH AND SHOWER
EF	EACH FACE, EXHAUST FAN
EG	SUCH AS
EJ	EXPANSION JOINT
EL, ELEV	ELEVATION
ELB	ELBOW
ELEC	ELECTRICAL
EOP	EDGE OF PAVEMENT
EQ	EQUAL
ERCP	ELLIPTICAL REINFORCED CONCRETE PIPE
EST	ELEVATED STORAGE TANK
ETC	ETCETERA
EW	EACH WAY
EXIST	EXISTING
FBC	FLORIDA BUILDING CODE
F, FU	FUSE
F/F	FINISHED FLOOR
FAB	FABRICATED
FAC	FLORIDA ADMINISTRATIVE CODE
FCA	FLANGED COUPLING ADAPTER
FCV	FLOW CONTROL VALVE
FDEP	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
FDN	FOUNDATION
FDOT	FLORIDA DEPARTMENT OF TRANSPORTATION
FDR	FEEDER
FE	FLOW ELEMENT
FF	FINISHED FLOOR
FFE	FINISHED FLOOR ELEVATION
FG	FINISHED GRADE, FIBERGLASS
FH	FIRE HYDRANT
FIG	FIGURE
FIN	FINISHED
FIT	FLOW INDICATING TRANSMITTER
FJ	FLANGED JOINT
FL	FLOOR
FLEX	FLEXIBLE
FLG	FLANGE(D)
FND	FOUNDATION
FNPT	FEMALE NATIONAL PIPE THREAD
FO	FIBER OPTIC
FOS	FAST-OFF-SLOW
FOSA	FAST-OFF-SLOW-AUTO
FOSR	FAST-OFF-SLOW-REMOTE
FP	FULL PENETRATION, FIELD PANEL
FR	FORWARD-REVERSE
FREQ	FREQUENCY
FRP	FIBER REINFORCED PLASTIC
FS	FLORIDA STATUTES, FAR SIDE, FLOW SWITCH
FT	FOOT
G	GROUND
GAL	GALLON
GALV	GALVANIZED
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERUPTER
GND	GROUND
GPM	GALLONS PER MINUTE
GR	GRADE
GRTG	GRATING
GS	GALVANIZED STEEL
GSP	GALVANIZED STEEL PIPE
GST	GROUND STORAGE TANK
GV	GATE VALVE
H	HIGH
HA	HAND AUGER
HD	HAND
HDD	HORIZONTAL DIRECTIONAL DRILL
HDNS	HARDNESS
HDPE	HIGH DENSITY POLYETHYLENE
HHWL	HIGH HIGH WATER LEVEL
HK	HOOK
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HR	HANDRAIL
HSP	HIGH SERVICE PUMP
HT	HEIGHT
HWL	HIGH WATER LEVEL
I&C	INSTRUMENTATION AND CONTROL
IC	INTERRUPTING CAPACITY
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
IF	INSULATED FLANGE
IJ	ISOLATION JOINT
INC	INCORPORATED
IPS	IRON PIPE SIZE
J, JB	JUNCTION BOX
JT	JOINT
KA	KILOAMPERES
KB	KNEE BRACE
KCMIL	THOUSAND CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT AMPERES
KW	KILOWATTS
KWH	KILOWATT HOUR
L	LOWER
LB, LBS	POUND(S)
LE	LEVEL ELEMENT
LEL	LOWER EXPLOSIVE LIMIT
LF	LINEAR FEET
LG	LONG
LIT	LEVEL INDICATING TRANSMITTER
LIU	LIGHT INTERFACE UNIT
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LLWL	LOW LOW WATER LEVEL
LOS	LOCKOUT STOP
LR	LONG RADIUS, LOCAL-REMOTE
LS	LIFT STATION
LSIG	LONG SHORT INSTANTANEOUS GROUND
LWL	LOW WATER LEVEL
M	MAGNETIC CONTACTOR COIL, MOTOR, MANUAL
M/F	MALE/FEMALE
MAX	MAXIMUM
MC	MODULATE-CLOSE
MCC	MOTOR CONTROL CENTER
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MES	MITERED END SECTION
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MNPT	MALE NATIONAL PIPE THREAD
MO	MOTOR OPERATOR
MP	METERING PUMP
MPH	MILES PER HOUR
MS	MOTOR STARTER
MSC	MANUFACTURER SUPPLIED CABLE
MT, MTD	MOUNT(ED)
MTL	METAL
MV	MEDIUM VOLTAGE
N	NORTH(ING), NEUTRAL, NORMAL
N/A	NOT APPLICABLE
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NC	NORMALLY CLOSED
NE	NORTH EAST
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NPT	NATIONAL PIPE THREAD
NPW	NON POTABLE WATER
NRS	NONRISING STEM
NS	NEAR SIDE
NSF	NATIONAL SANITATION FOUNDATION
NTS	NOT TO SCALE
NW	NORTH WEST
OC	ON CENTER(S), OPEN-CLOSE(D)
OCA	OPEN-CLOSE-AUTO
OCR	OPEN-CLOSE-REMOTE
OD	OUTSIDE DIAMETER
OF	OVERFLOW
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
OPP	OPPOSITE
ORP	OXIDATION REDUCTION POTENTIAL
OS&Y	OUTSIDE STEM AND YOKE
OSC	OPEN-STOP-CLOSE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
P&ID	PIPING AND INSTRUMENTATION DIAGRAM
P/L	PROPERTY LINE
PB	PULL BOX
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PCV	PRESSURE CONTROL VALVE
PE	PLAIN END, POLYETHYLENE
PET	POLYETHYLENE TUBING
PF	POWER FACTOR
pH	HYDROGEN ION CONCENTRATION
PH	PHASE
PI	POINT OF INTERSECTION/PLANT INFLUENT
PID	PROPORTIONAL INTEGRAL DERIVATIVE
PIT	PRESSURE INDICATING TRANSMITTER
PIV	POST INDICATOR VALVE
PL	PLATE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PLCS	PLACES
POC	POINT OF CONNECTION
POE	POINT OF ENTRY
POJ	PUSH ON JOINT
PP	POWER POLE
PPE	PERSONAL PROTECTIVE EQUIPMENT
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSID	POUNDS PER SQUARE INCH DIFFERENTIAL
PSIG	POUNDS PER SQUARE INCH GAUGE
PSV	PRESSURE SUSTAINING VALVE
PT	PRESSURE TREATED, POTENTIAL TRANSFORMER
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PW	POTABLE WATER
PWR	POWER
R	RADIUS
R/W, ROW	RIGHT-OF-WAY
RCP	REINFORCED CONCRETE PIPE
RCPT	RECEPTACLE
RED	REDUCER
REF	REFERENCE
REINF	REINFORCEMENT, REINFORCING
REQ, REQ'D	REQUIRED
RGS	RIGID GALVANIZED STEEL
RJ	RESTRAINED JOINT
RM	REMOTE MULTIPLEXING MODULE
RMS	ROOT MEAN SQUARE
RPZ	REDUCED PRESSURE ZONE
RT	RIGHT
RTU	REMOTE TELEMETRY UNIT
SARV	SURGE ANTICIPATOR RELIEF VALVE
SBC	STANDARD BUILDING CODE
SCH	SCHEDULE
SCJ	SAW CUT JOINT
SDI	STEEL DECK INSTITUTE
SE	SOUTH EAST
SEC	SECOND
SF	SLOWER-FASTER
SHEC	SHOULDERED-END COUPLING
SHT	SHEET
SIM	SIMILAR
SJI	STEEL JOINT INSTITUTE
SM	STATIC MIXER
SP	SPACING, SPACED
SPD	SURGE PROTECTIVE DEVICE
SQ	SQUARE
SR	STATE ROAD, SURGE RELIEF
SRV	SURGE RELIEF VALVE
SS	START-STOP
SS, SST	STAINLESS STEEL
SSC	SUPERVISORY SET POINT CONTROL
SSRV	SOLID STATE REDUCED VOLTAGE
ST	SHUNT TRIP
STA	STATION
STD	STANDARD
STL	STEEL
STS	STORMWATER SEWER
SW	SOUTH WEST, SWITCH
SWD	SIDE WATER DEPTH
SWJ	SOLVENT WELD JOINT
SWPPP	STORM WATER POLLUTION PREVENTION PLAN
SY	SQUARE YARD
T, THK	THICK
T/	TOP OF
T/B,T&B	TOP AND BOTTOM
TBM	TEMPORARY BENCHMARK
TEMP	TEMPERATURE
TGS	THREADED GALVANIZED STEEL
TGSP	THREADED GALVANIZED STEEL PIPE
TH	TOTAL HEAD
THERMO	THERMOSTATIC
THD	THREADED
TJB	TERMINAL JUNCTION BOX
TK	TANK
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TOSJ	TOP OF STEEL JOIST
TOW	TOP OF WALL
TS	TUBULAR STEEL
TSF	THICKENED SLAB FOOTING
TSP	TWISTED SHIELDED PAIR
TURB	TURBIDITY
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITER'S LABORATORIES
ULC	ULTRASONIC LEVEL CONTROLLER
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTAGE, VOLTS
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VH	VAPOR HEATER
VIB	VIBRATION
VIF	VERIFY IN FIELD
VP	VAPORIZER
W	WIDE, WATT
W/	WITH
W/O	WITHOUT
WCJ	WALL CONTROL JOINT
WF	WALL FOOTING
WGT	WEIGHT
WP	WORK POINT, WEATHERPROOF
WSE, WSEL	WATER SURFACE ELEVATION
WT	WEIGHT
WV	WATER VALVE
WWF	WELDED WIRE FABRIC
XFMR	TRANSFORMER
XS	EXTRA STRONG

CUSTOM ABBREVIATIONS

COZ	CITY OF ZEPHYRHILLS
SWFWMD	SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
ISO	ISOMETRIC
EOR	ENGINEER OF RECORD
FM	FORCE MAIN
WM	WATER MAIN

NOTES:
1. SEE LEGENDS AND PIPE SCHEDULE FOR ADDITIONAL ABBREVIATIONS.
2. NOT ALL ABBREVIATIONS MAY BE USED FOR THIS PROJECT.

BID DOCUMENTS

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

ABBREVIATIONS

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MECHANICAL LEGEND

CIVIL LEGEND

- CONTOURS (90)
- MATCHLINE
- RIGHT–OF–WAY BOUNDARY
- PROPERTY BOUNDARY
- EASEMENT BOUNDARY
- CENTERLINE
- WATERMAIN LINE (WM)
- FORCE MAIN (FM)
- GAS LINE (G)
- ELECTRICAL LINE (E)
- CHLORINE LINE
- SILT FENCE (SF)
- TURBIDITY BARRIER (TB)
- DEMO HATCH
- WETLAND (WL)
- SPOT ELEVATION (+100.00)
- REINFORCED CONCRETE PIPE (RCP)
- TRENCH DRAIN
- MITERED END SECTION (S-1) W/ STRUCTURE DESIGNATION
- FLARED END SECTION (S-1) W/ STRUCTURE DESIGNATION
- DITCH BOTTOM INLET (S-1) W/ STRUCTURE DESIGNATION
- COORDINATE POINT
- PROPOSED SIGN
- CONCRETE
- LIMEROCK
- COMPACTED SOIL
- GRAVEL
- ASPHALT RESTORATION
- FORCEMAIN FLOW DIRECTION
- POTENTIAL UTILITY CONFLICT

PIPING SYMBOLS

DOUBLE LINE	SINGLE LINE	
		PIPE
		WELDED PIPE
		FLANGED JOINT
		MECHANICAL JOINT OR RESTRAINED PUSH–ON JOINT
		FLEXIBLE COUPLING ADAPTER
		EXPANSION JOINT
		HUB & SPIGOT JOINT
		BALL JOINT
		FLANGED COUPLING ADAPTER W/ THRUST TIES
		FLEXIBLE COUPLING WITH THRUST TIES
		BLIND FLANGE
		ELBOW UP
		ELBOW DOWN
		TEE UP
		TEE DOWN
		FEMALE QUICK DISCONNECT FITTING
		MALE QUICK DISCONNECT FITTING

DOUBLE LINE	SINGLE LINE	
		LATERAL UP
		LATERAL DOWN
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		UNION
		CAP
		ANCHOR
		WYE
		TEE
		CROSS
		ELBOW, 90 DEGREE
		ELBOW, 45 DEGREE
		ELBOW, 22.5 DEGREE
		ABANDON IN PLACE
		DEMOLISH AND REMOVE

VALVE SYMBOLS

- GATE
- BUTTERFLY
- BALL
- CHECK
- DIAPHRAGM
- NEEDLE
- PRESSURE RELIEF
- AIR RELEASE AND/OR VACUUM RELIEF
- REGULATED SIDE (D)
- HYDRAULIC CONTROL VALVE

ACTUATOR SYMBOLS

- M XX — ELECTRIC MOTOR
- EH XX — ELECTROHYDRAULIC
- P XX — PNEUMATIC
- H XX — HYDRAULIC
- S — SOLENOID
- MANUAL

NOTE:

ON LOSS OF PRIMARY POWER
(PNEUMATIC, ELECTRICAL OR HYDRAULIC)
XX: FO = FAIL OPEN
FC = FAIL CLOSED
FLP = FAIL TO LAST POSITION

PIPE SUPPORT SYMBOLS

- U–SHAPED PIPE SUPPORT
- FLANGED PIPE SUPPORT
- PIPE SUPPORT W/ AXIAL LOAD SUPPORT

PIPE SCHEDULE NOTES:

GENERAL NOTES:
1. COAT BURIED AND SUBMERGED PIPE PER PIPE SPECIFICATIONS.
2. TEST LINES PER SECTION 15144 UNLESS NOTED OTHERWISE.
3. LABEL ALL PIPING PER SECTION 15075.

RESTRAINT SYSTEM NOTES:
(1) SEE RESTRAINT DETAILS C24

SPECIFIC NOTES:
(A) DISINFECT PIPING PER SECTION 15141.
(B) APPLY ABOVE GRADE PAINT SYSTEM ONLY TO PIPING EXPOSED TO SUNLIGHT. PIPING UNDER FACILITY CANOPY STRUCTURE SHALL BE CLASSIFIED AS EXPOSED TO SUNLIGHT.
(C) BURIED DUCTILE IRON PIPE SHALL BE POLYETHYLENE WRAPPED PER SECTION 15155 PART 2.11.

PIPE SCHEDULE

ABBREVIATION	FLOW STREAM IDENTIFICATION	PIPE/DUCT MATERIAL	PIPE MATERIAL ABBREV	DIMENSION RATIO (DR)	SPECIFICATION NUMBER	PIPE LINING	NORMAL MAX OPERATING PRESSURE (PSIG)	FIELD TEST PRESSURE (PSIG)	EXPOSED PIPE PAINT SYSTEM	COLOR CODE	SPECIFIC NOTES	RESTRAINT SYSTEM NOTES
FM–1	FORCE MAIN	POLYVINYL CHLORIDE	PVC	18	15291	N/A		150	N/A	GREEN	N/A	(1)
FM–2	FORCE MAIN	DUCTILE IRON	DI	N/A	15155	EPOXY		150	N/A	GREEN	N/A	(1)
FM–3	FORCE MAIN	HIGH DENSITY POLYETHYLENE	HDPE	11	15146	N/A		160	N/A	GREEN	N/A	(1)
WM–1	WATER MAIN	POLYVINYL CHLORIDE	PVC	18	15291	N/A		150	N/A	BLUE	(A)	(1)
WM–2	WATER MAIN	HIGH DENSITY POLYETHYLENE	HDPE	11	15146	N/A		160	N/A	BLUE	(A)	(1)

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

LEGENDS AND PIPE SCHEDULE

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SURVEYOR'S NOTES:

1. USE OF THIS SURVEY FOR PURPOSES OTHER THAN INTENDED, WITHOUT WRITTEN VERIFICATION, WILL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO THE SURVEYOR. NOTHING HEREIN SHALL BE CONSTRUED TO GIVE ANY RIGHTS OR BENEFITS TO ANYONE OTHER THAN THOSE CERTIFIED TO. THIS SURVEY MEETS THE "STANDARDS OF PRACTICE" SET FORTH BY THE FLORIDA BOARD OF LAND SURVEYORS IN CHAPTER 5J-17 FLORIDA ADMINISTRATIVE CODE.
2. THIS SURVEY WAS PREPARED WITHOUT AN ABSTRACT OF TITLE; THEREFORE THE UNDERSIGNED MAKES NO GUARANTEES OR REPRESENTATIONS REGARDING INFORMATION SHOWN HEREON PERTAINING TO EASEMENTS, RIGHTS-OF-WAY, SETBACK LINES, AGREEMENTS, RESERVATIONS, OR OTHER SIMILAR MATTERS.
3. NO INSTRUMENTS OF RECORD REFLECTING EASEMENTS, RIGHT-OF-WAYS AND/OR OWNERSHIP WERE FURNISHED TO THE UNDERSIGNED EXCEPT AS SHOWN.
4. NO UNDERGROUND INSTALLATIONS, IMPROVEMENTS OR ENCROACHMENTS, HAVE BEEN LOCATED EXCEPT THOSE SHOWN HEREON.
5. ELEVATIONS SHOWN HEREON ARE BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), NATIONAL GEODETIC SURVEY BENCHMARK "D 663", LOCATED ALONG GALL BOULEVARD IN ZEPHYRHILLS, FL, PUBLISHED ELEVATION = 79.39' (NAVD88).
6. BEARINGS AND DISTANCES SHOWN HEREON ARE FIELD MEASURED, UNLESS OTHERWISE INDICATED.
7. THE TEXT FOR TIES TO IMPROVEMENTS INDICATES THE DIRECTION THEY LIE IN RELATION TO the BOUNDARY.
8. SUBJECT PROPERTY MAY CONTAIN LANDS THAT ARE SUBJECT TO JURISDICTION OR RESTRICTION BY ONE OR MORE OF THE FOLLOWING AGENCIES: ARMY CORP. OF ENGINEERS, SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (S.W.F.W.M.D.) OR FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (F.D.E.P.).

SURVEYOR'S LEGEND

- IP, IR = IRON PIPE, IRON ROD
- R/W = RIGHT-OF-WAY
- EL. = ELEVATION
- I.E. = INVERT ELEVATION
- F.F. = FINISHED FLOOR ELEVATION
- RCP = REINFORCED CONCRETE PIPE
- CMP = CORRUGATE METAL PIPE
- = SET 5/8" IR "DC JOHNSON LB 4514"
- = SET NAIL & DISK "LB 4514"
- = VERTICAL CONTROL BENCHMARK
- = POWER POLE/TELEPHONE POLE
- = LIGHT POLE
- = METER POLE
- = GUY POLE
- = GUY ANCHOR
- = BOLLARD
- = POST
- = ROADSIGN
- = REFLECTOR SIGN
- = MAILBOX
- = AIR CONDITIONER
- MW = MONITORING WELL
- = CHAIN LINK FENCE
- = VINYL FENCE
- = WIRE FENCE
- = WOOD FENCE
- 81.5 = SPOT ELEVATION
- = OAK TREE (SIZE AS NOTED)
- = PALM TREE (SIZE AS NOTED)
- = PINE TREE (SIZE AS NOTED)
- = TREE (UNKNOWN VARIETY)
- W = WATER METER
- = GATE VALVE - WATER
- = BACKFLOW PREVENTER - WATER
- = WATER LINE WITNESS POST
- = FIRE HYDRANT
- = GATE VALVE - FIRE
- = UTILITY VAULT/HAND HOLE
- = ELECTRIC METER
- = ELECTRIC BOX
- OHP = OVERHEAD POWER LINE
- = GAS LINE WITNESS POST
- = GAS VALVE
- GAS = GAS LINE
- = TELEPHONE EQUIPMENT BOX
- = TELEPHONE PEDESTAL
- = TELEPHONE VAULT/HAND HOLE
- = TELEPHONE RELEASE VALVE
- = TELEPHONE LINE WITNESS POST
- OHT = OVERHEAD TELEPHONE LINE
- = FIBER OPTIC VAULT/HAND HOLE
- = FIBER OPTIC WITNESS POST
- = ASPHALT
- = CONCRETE
- = GRAVEL/DIRT ROAD

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

SURVEY LEGEND AND NOTES

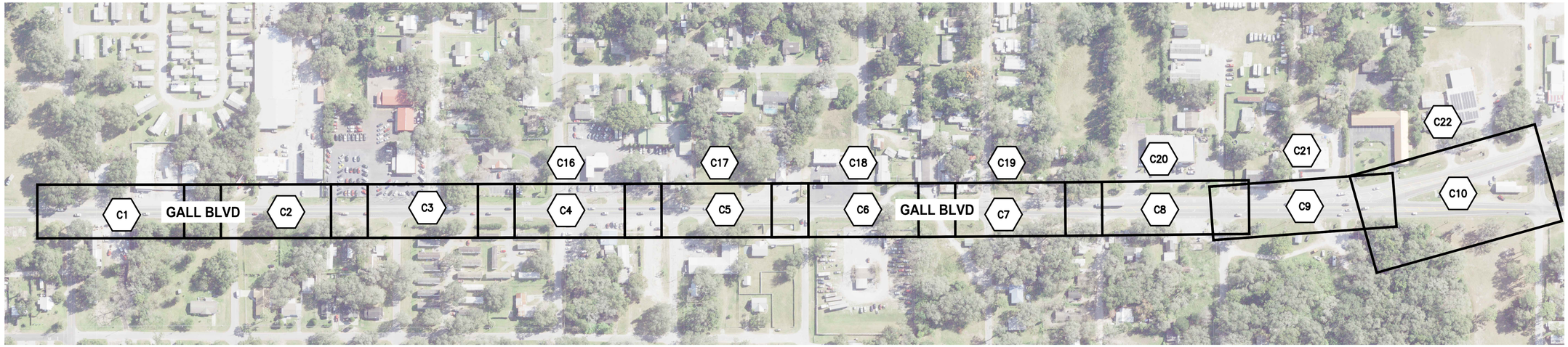
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

KEY MAP

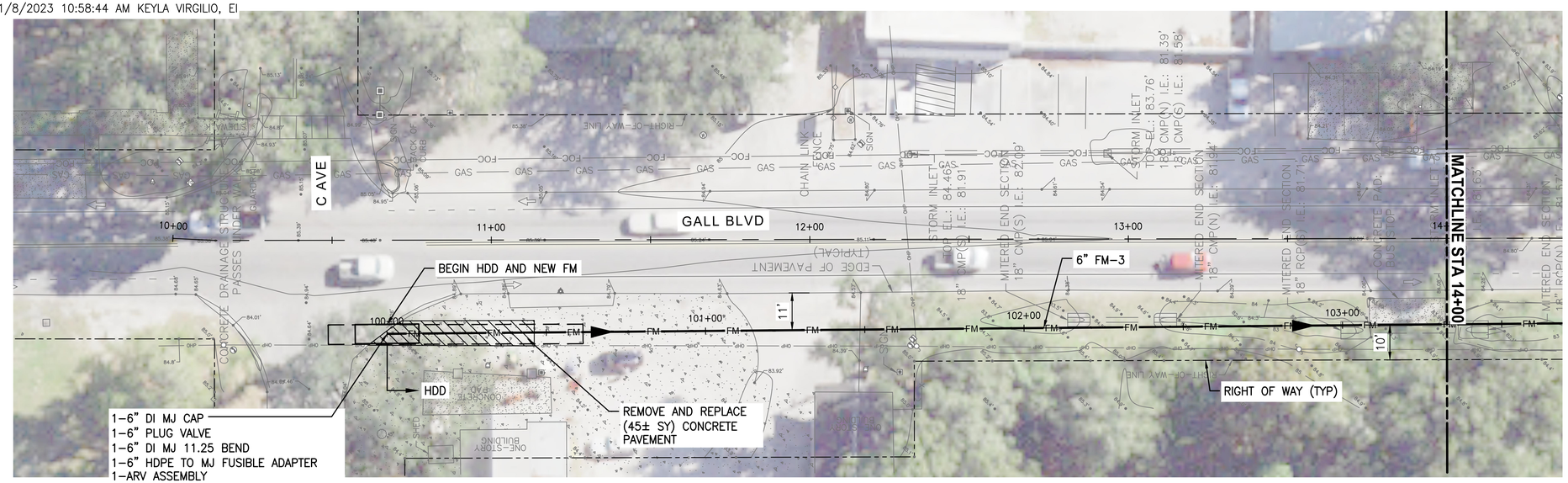
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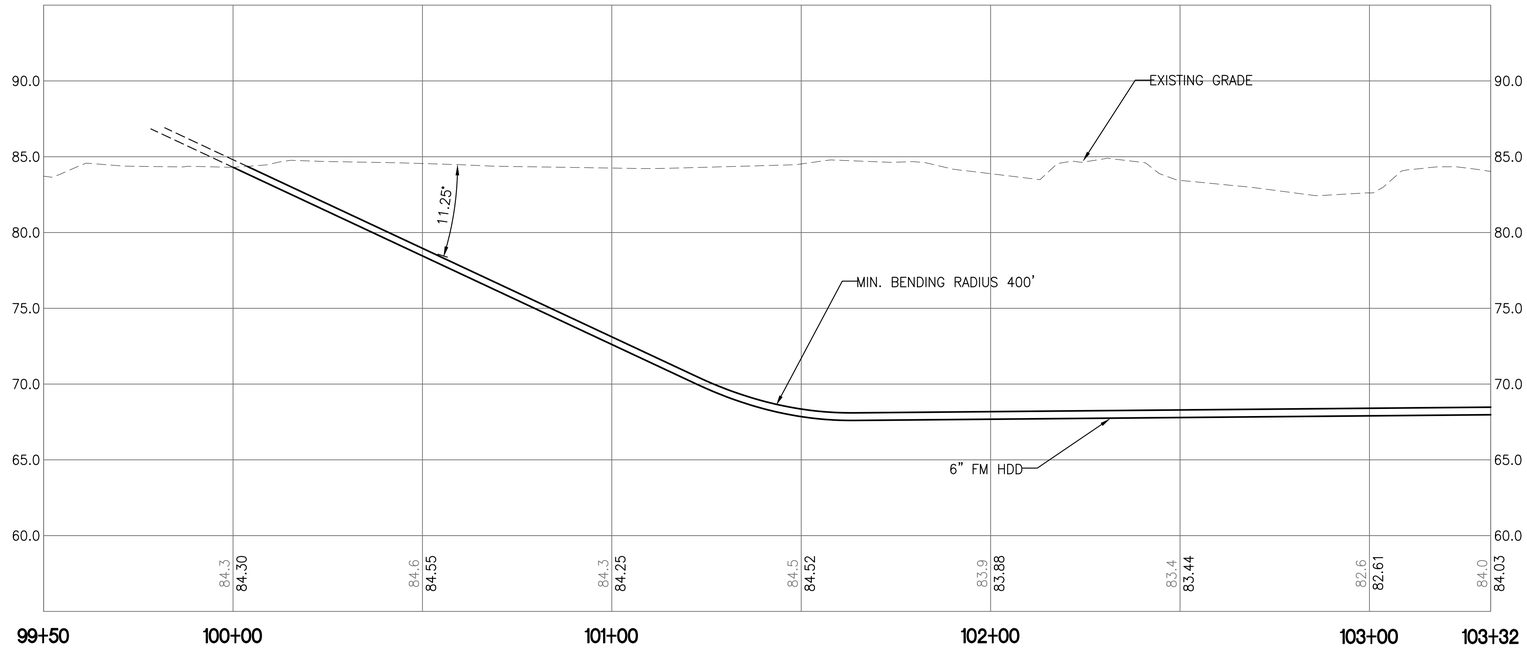
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INDEX NO:
DWG NO: G6

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1-6" DI MJ CAP
1-6" PLUG VALVE
1-6" DI MJ 11.25 BEND
1-6" HDPE TO MJ FUSIBLE ADAPTER
1-ARV ASSEMBLY
6" DR-18 PVC SPOOL PIPE



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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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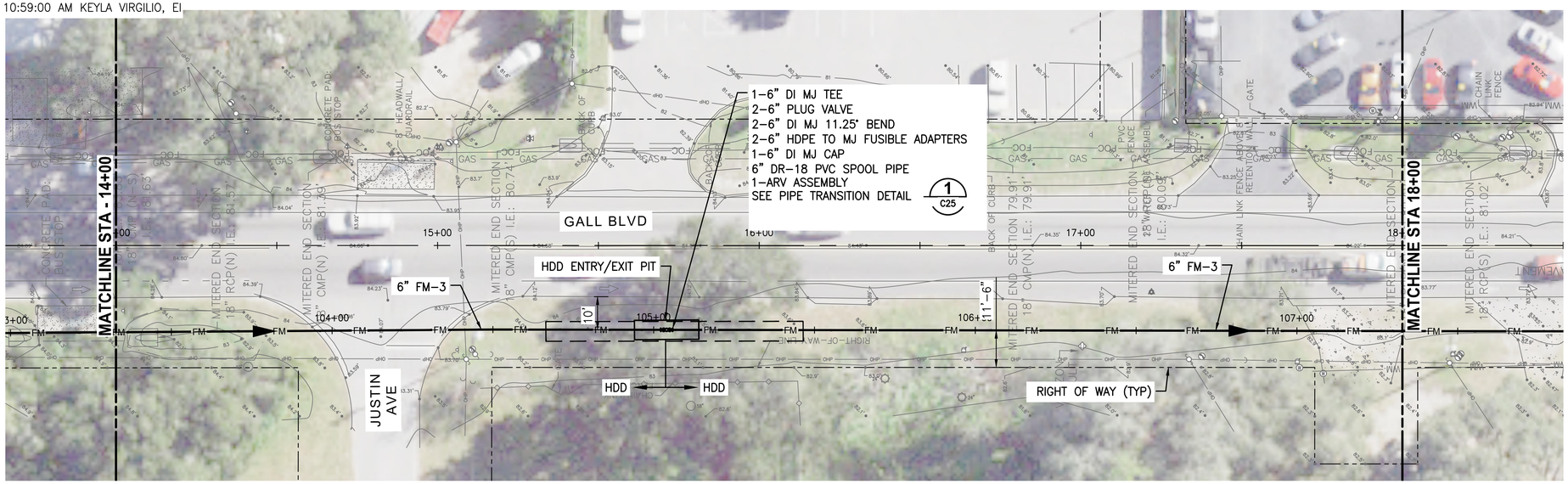
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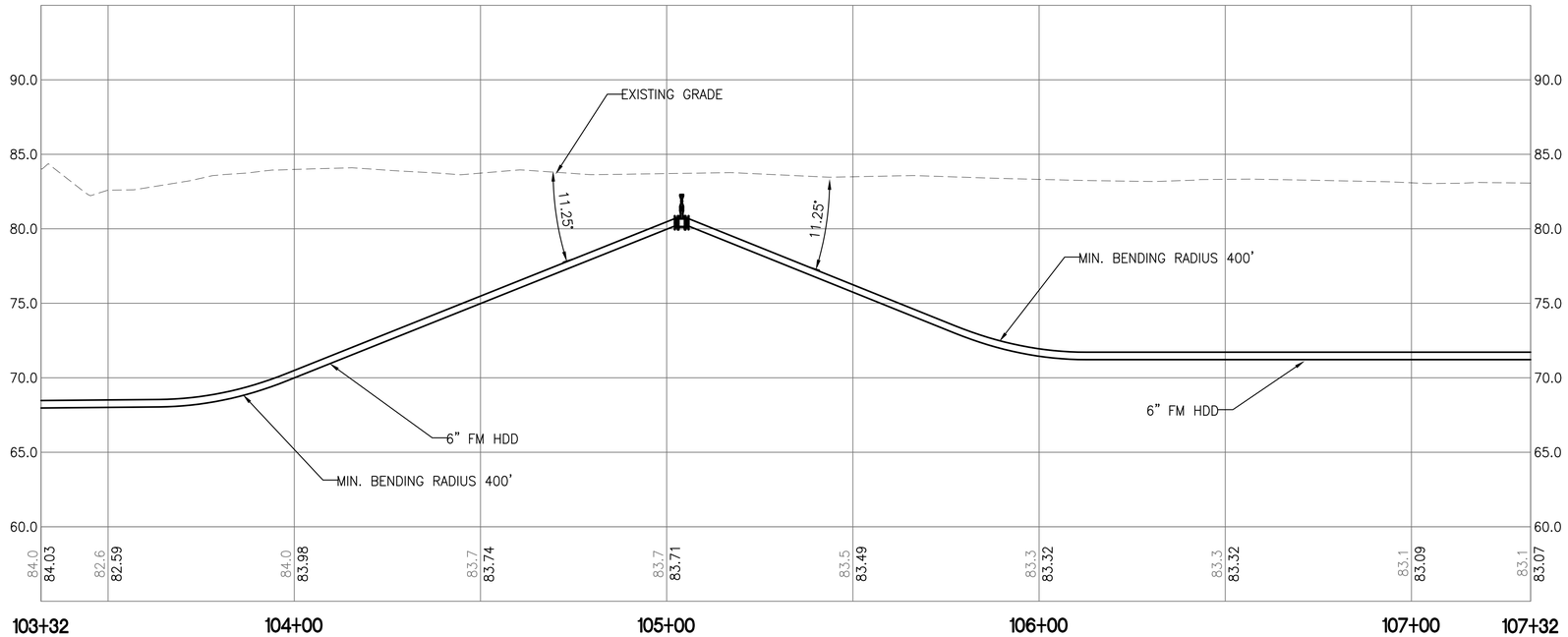
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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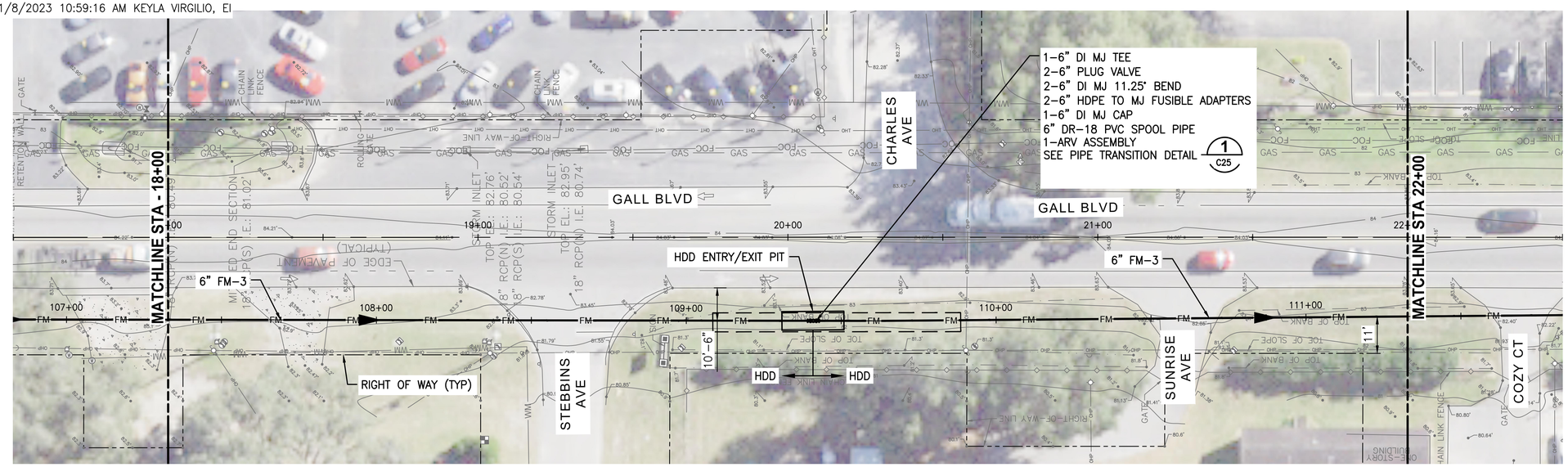
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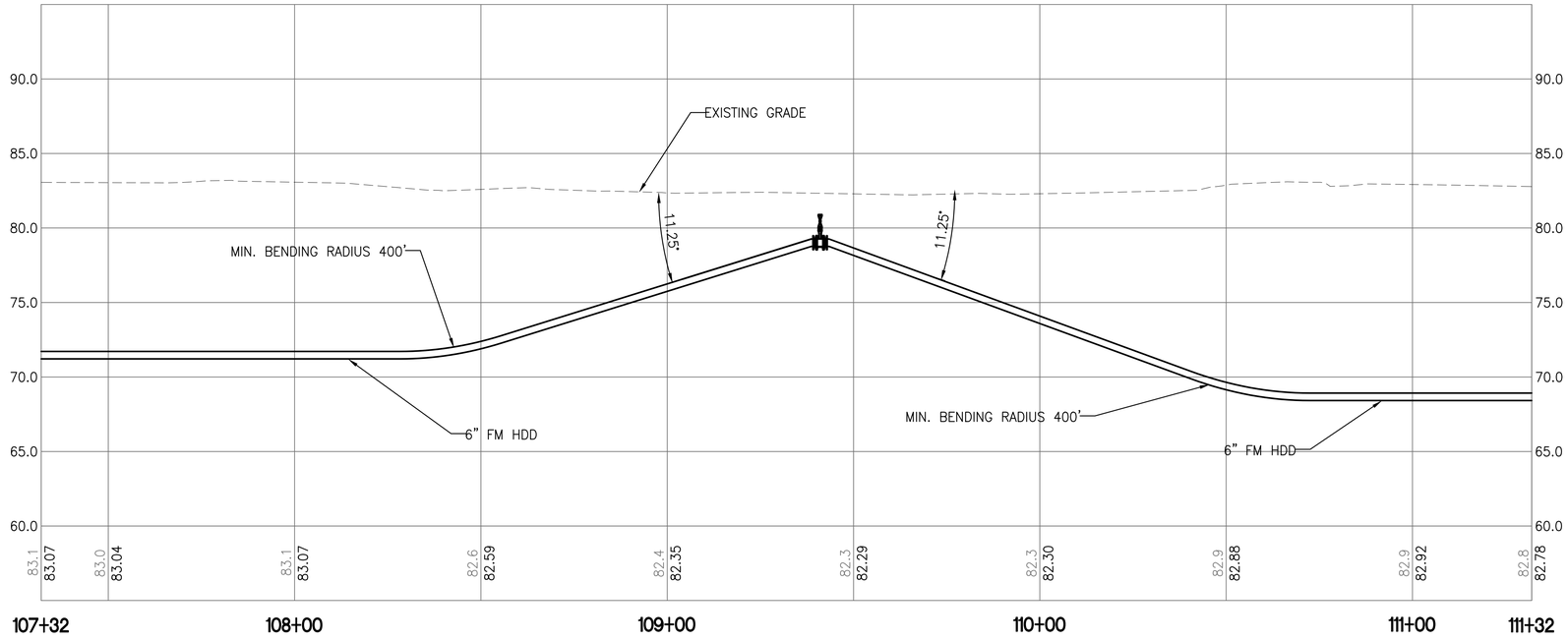
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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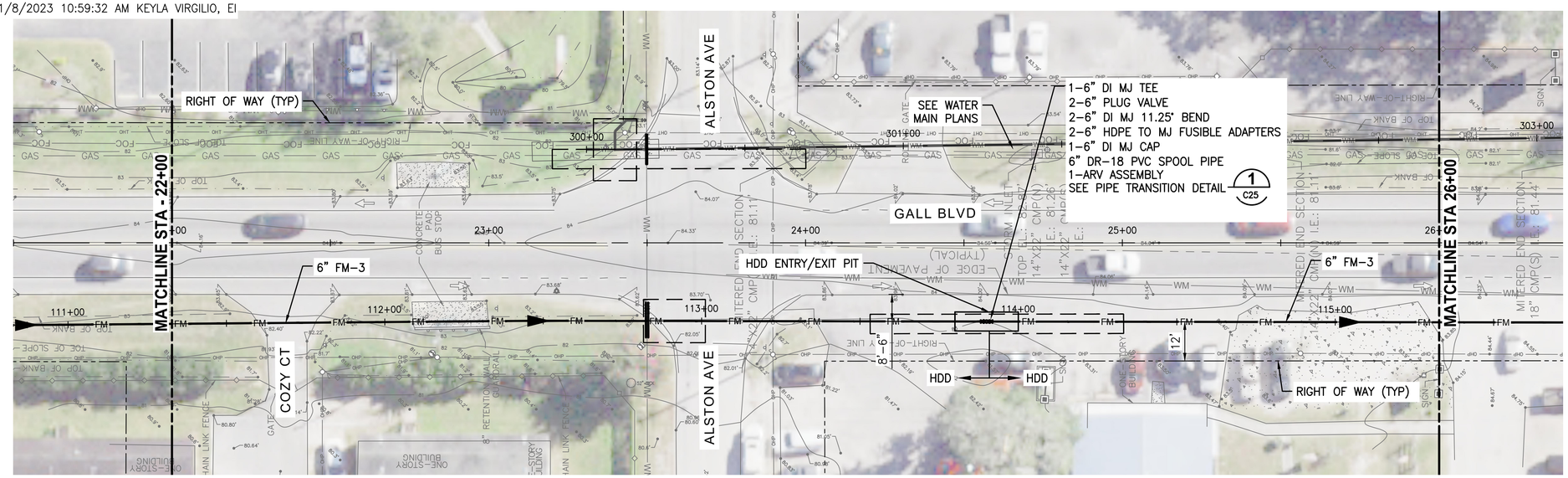
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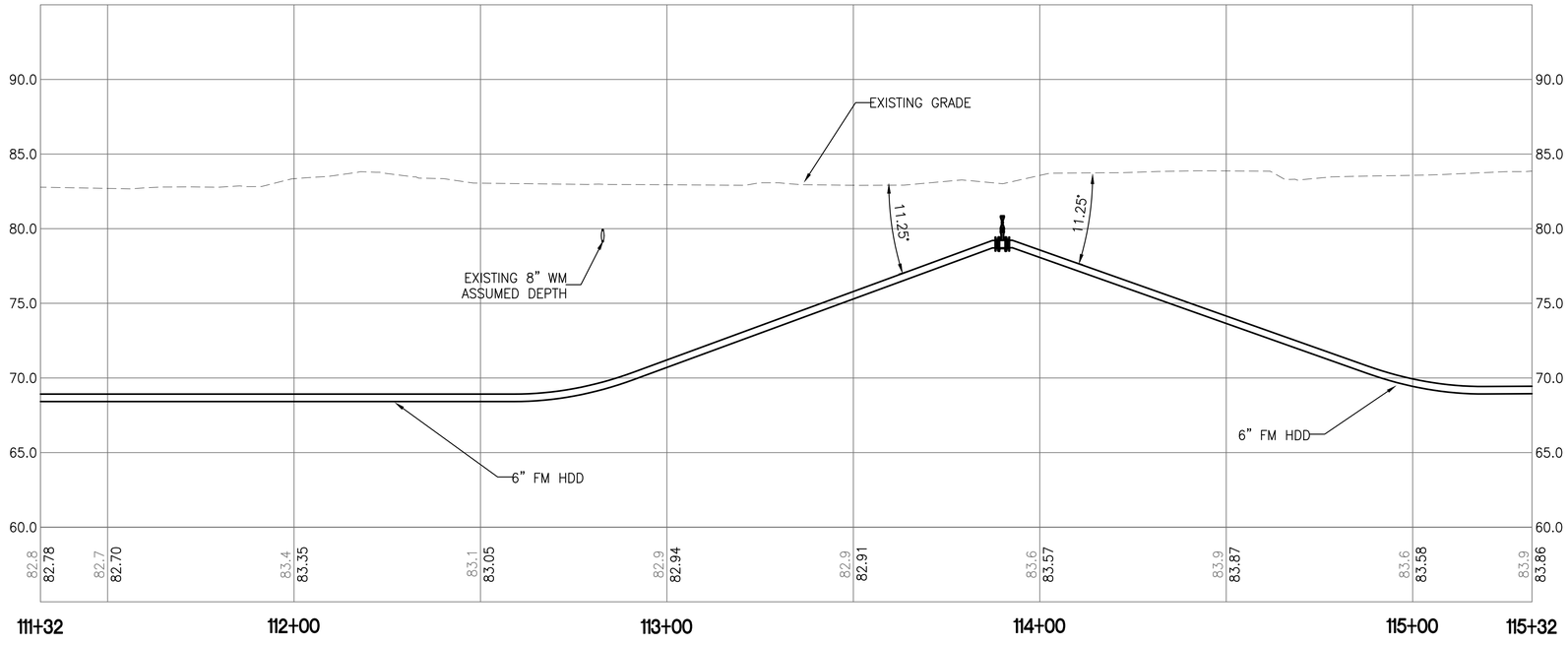
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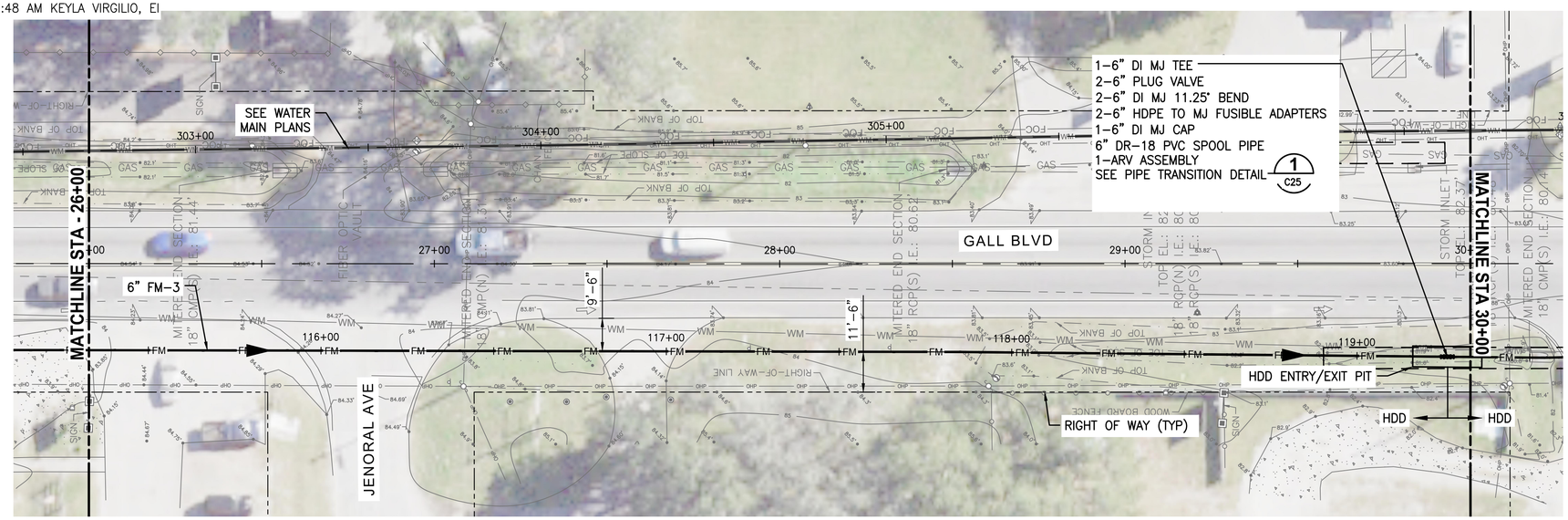
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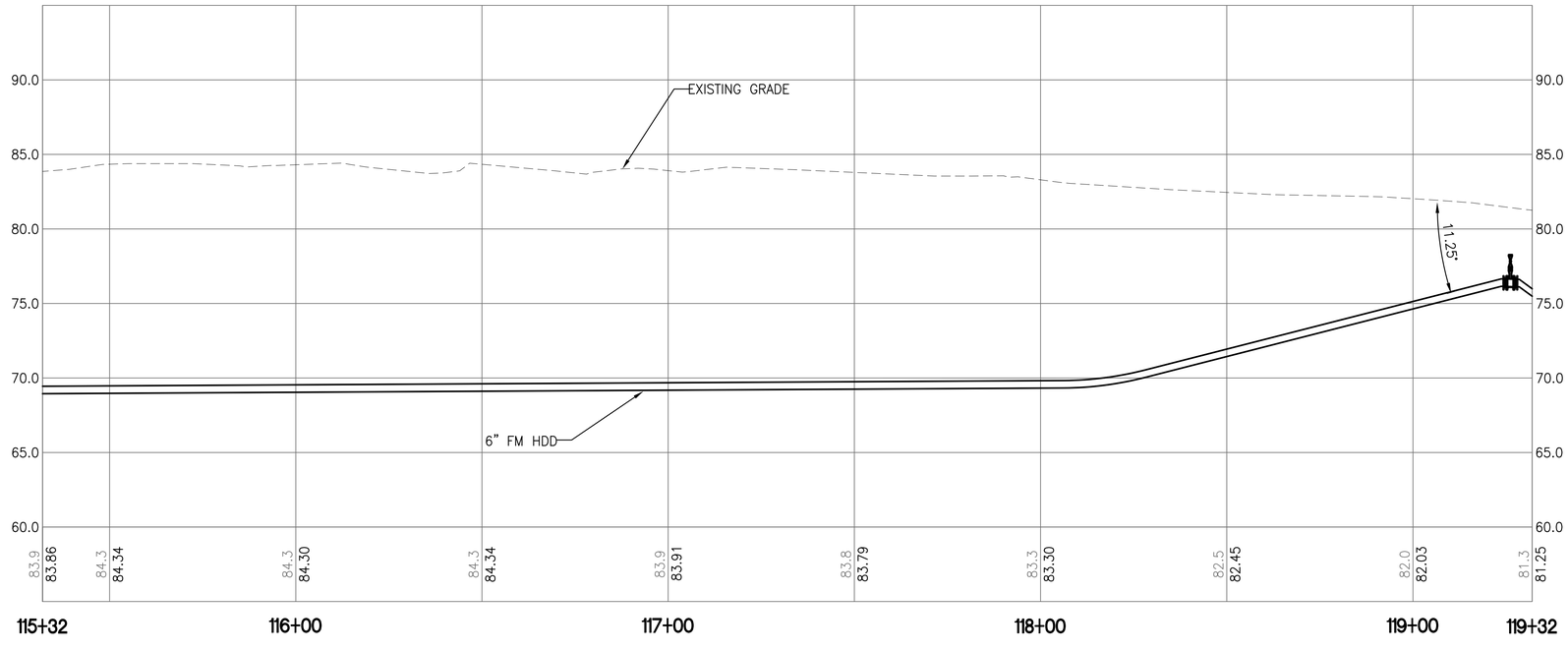
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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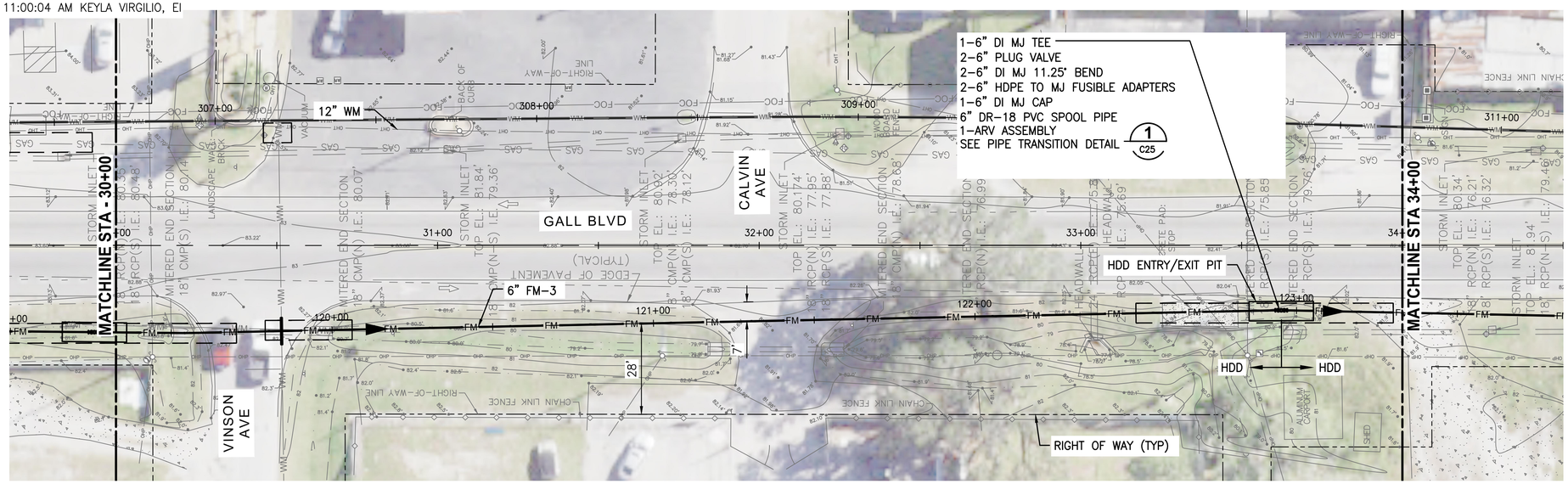
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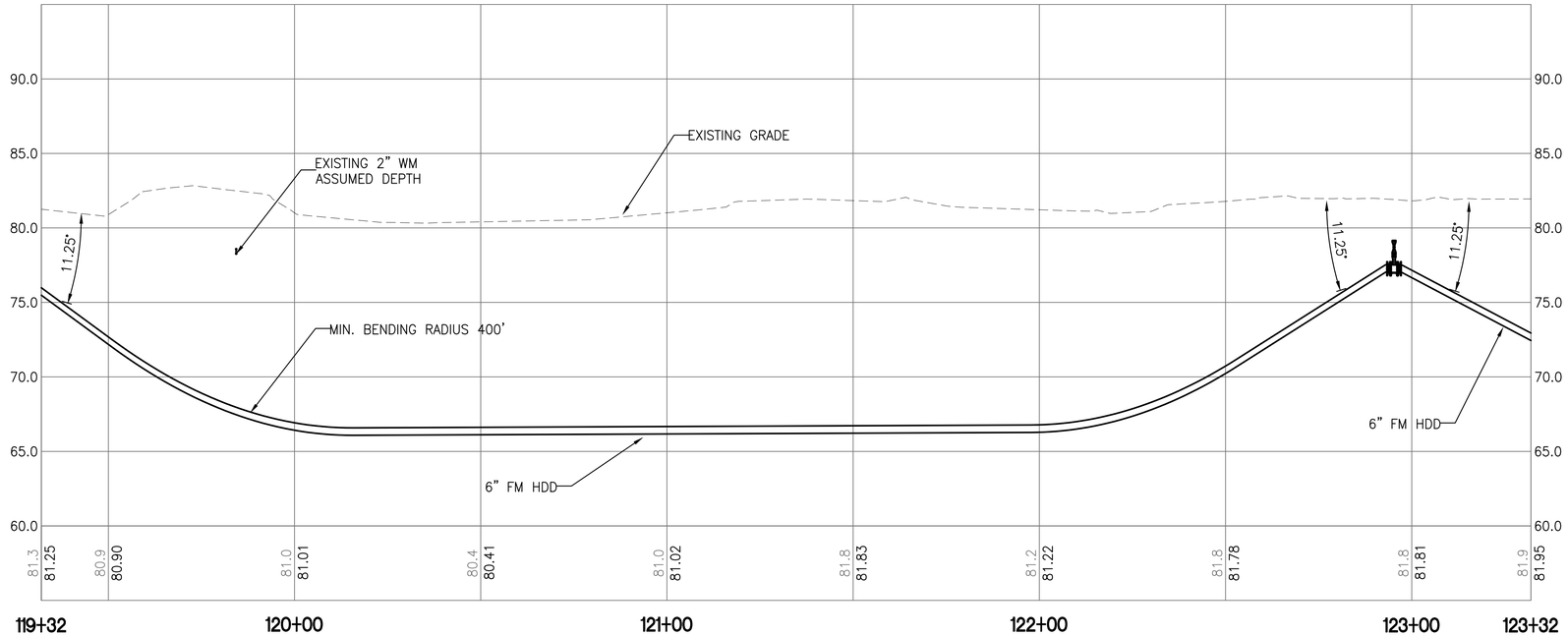
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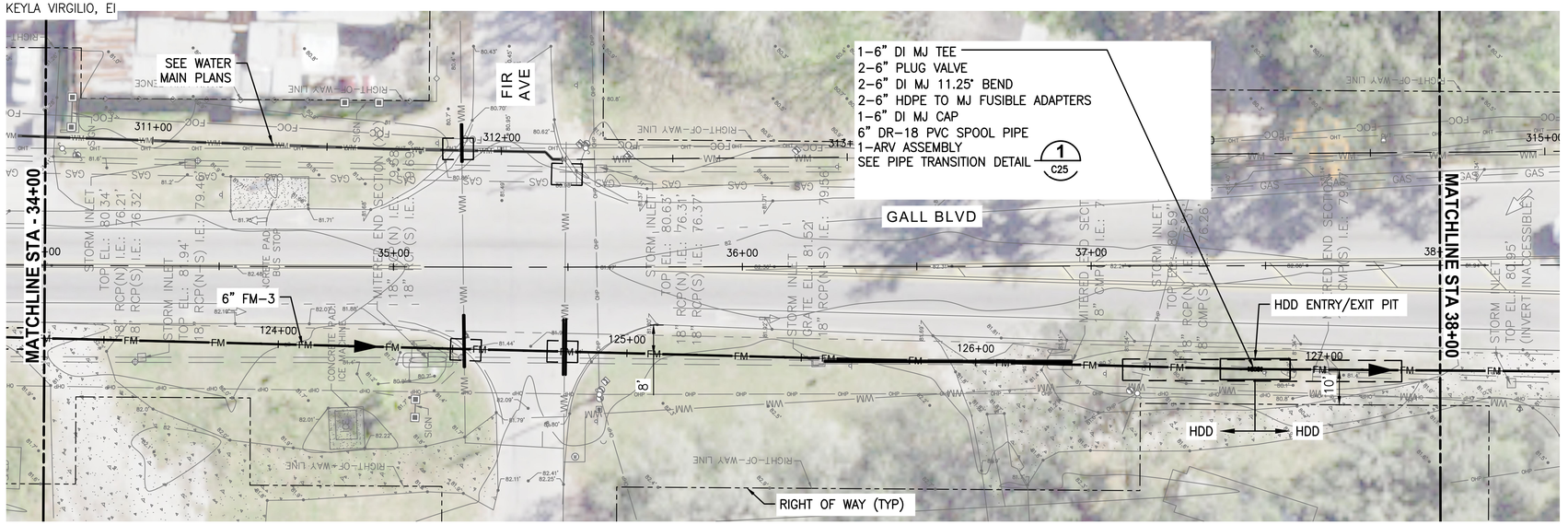
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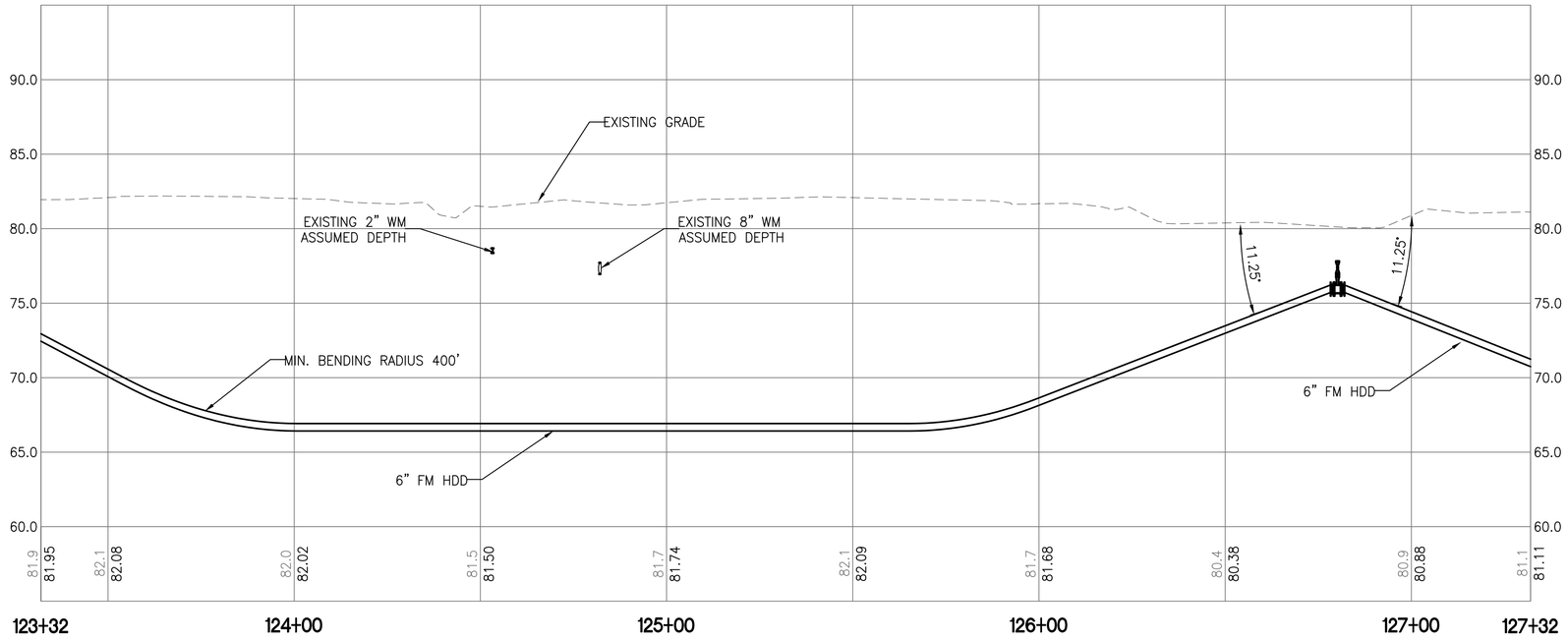
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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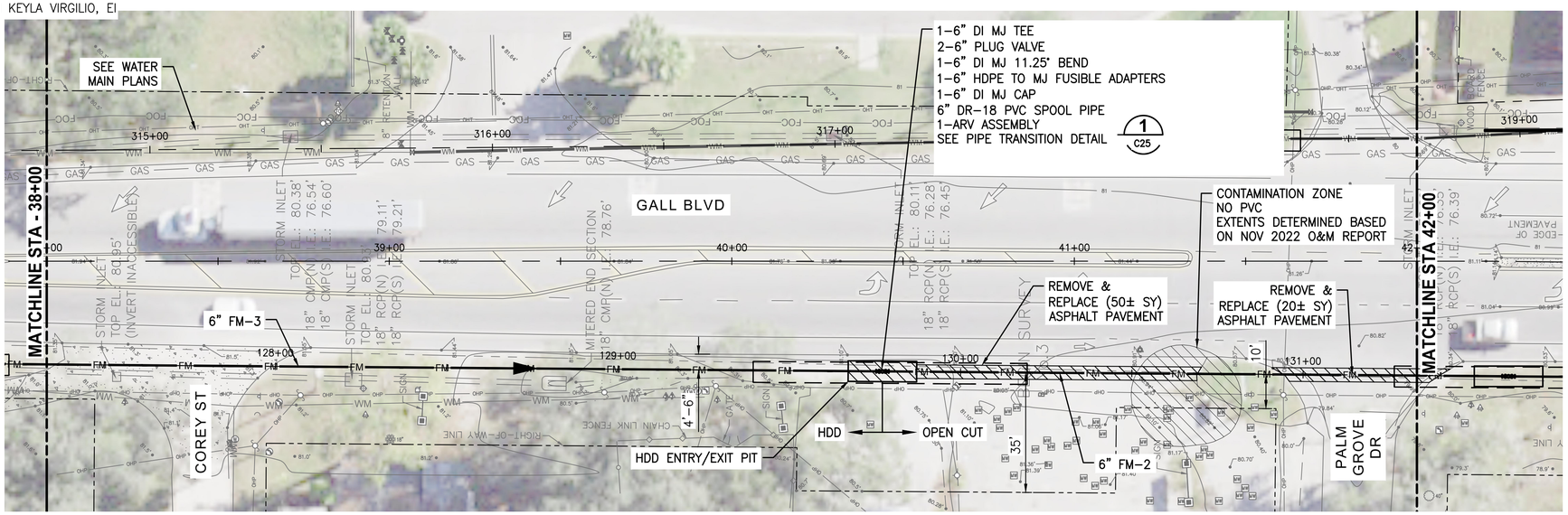
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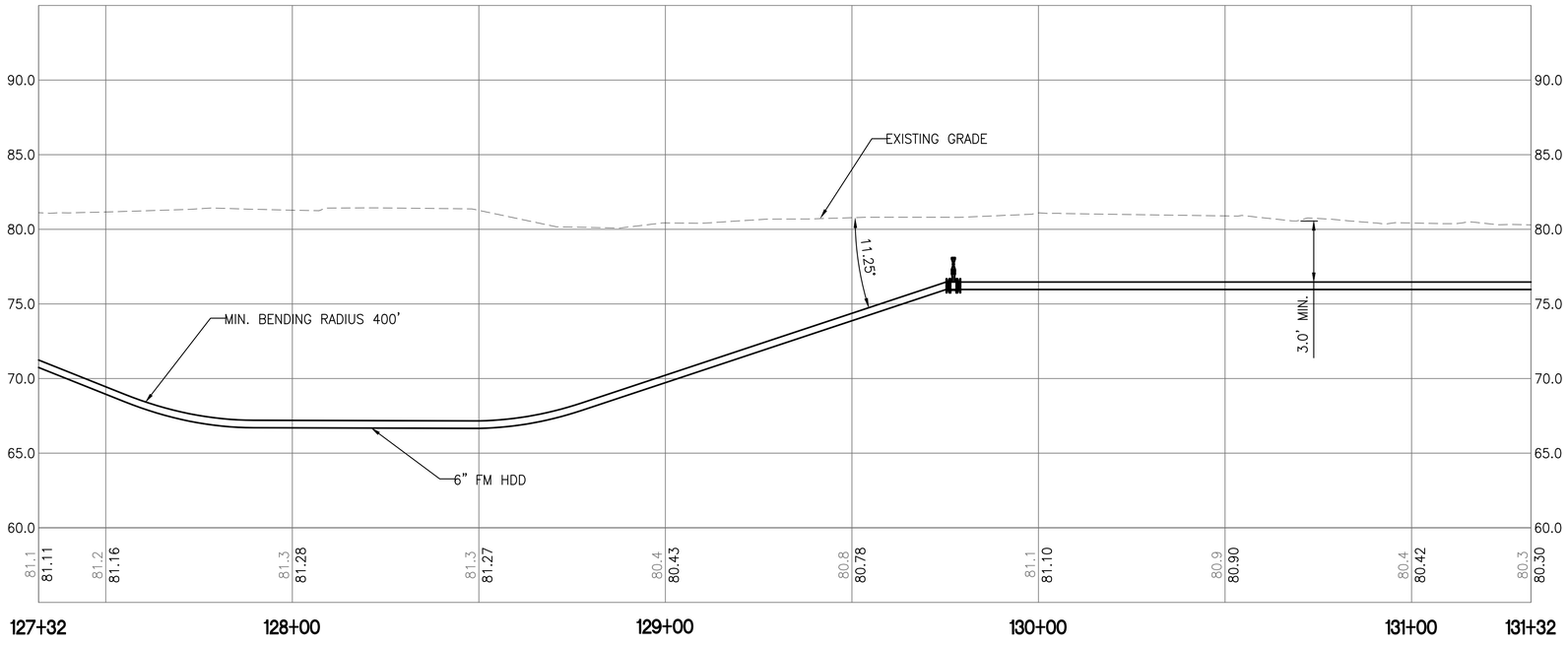
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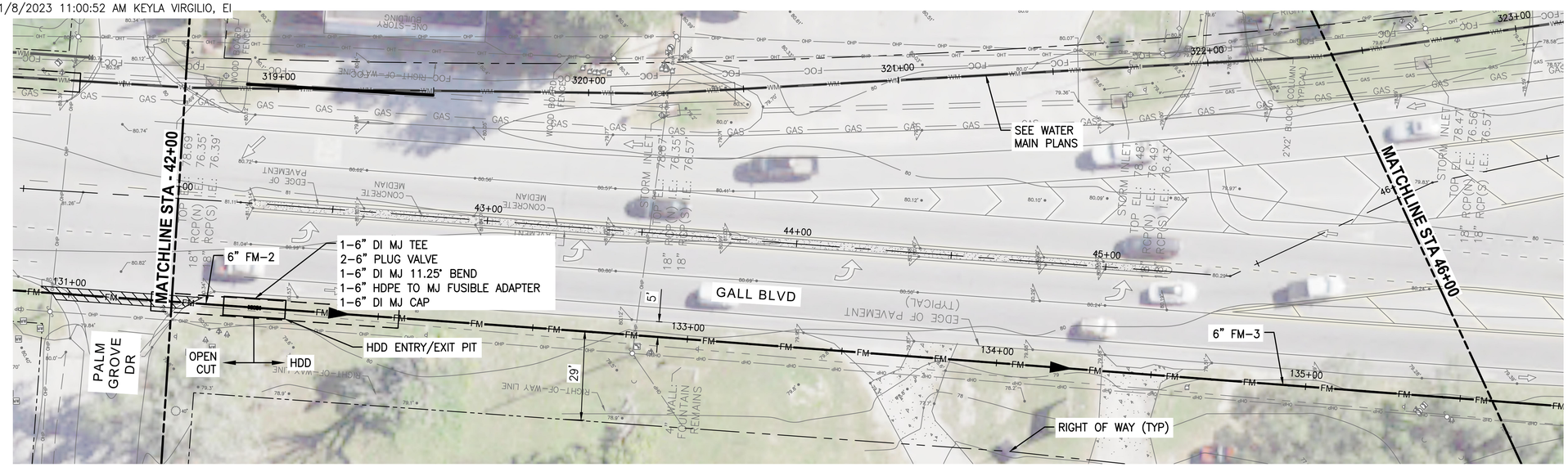
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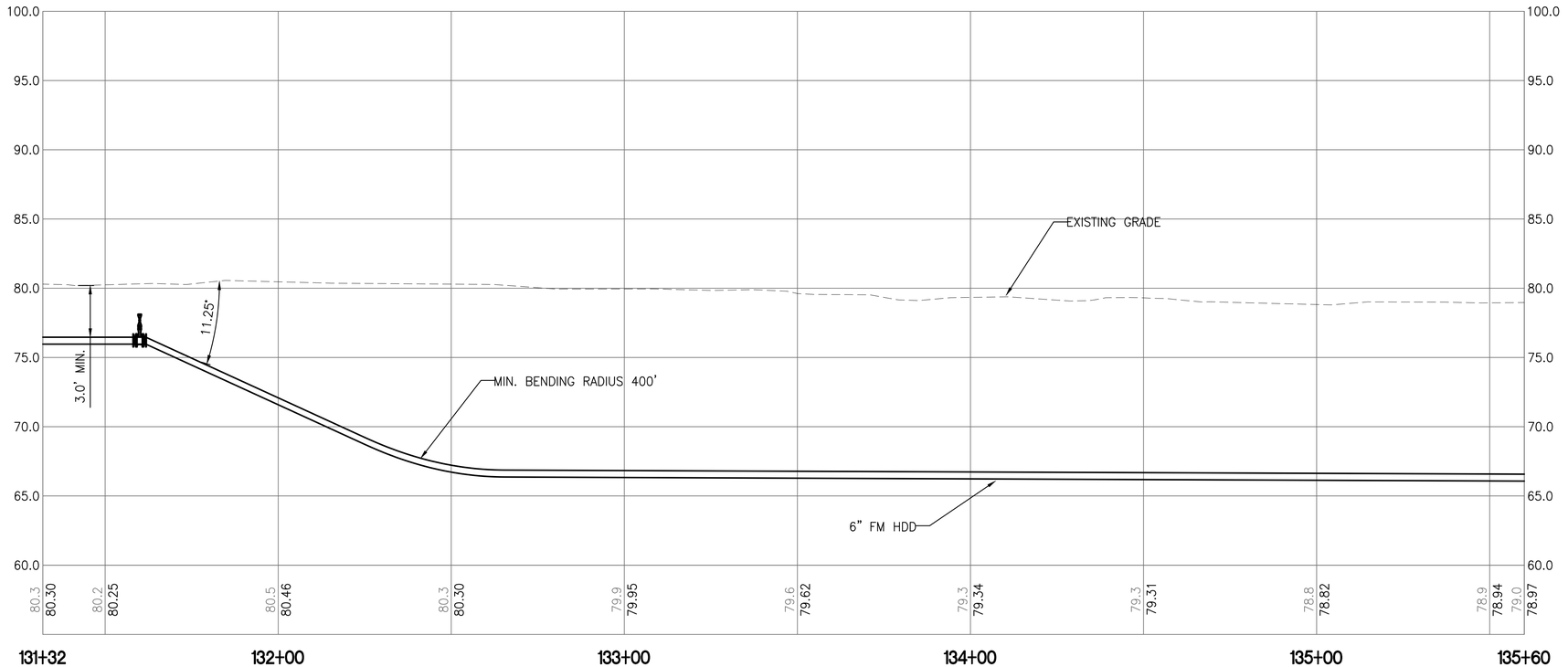
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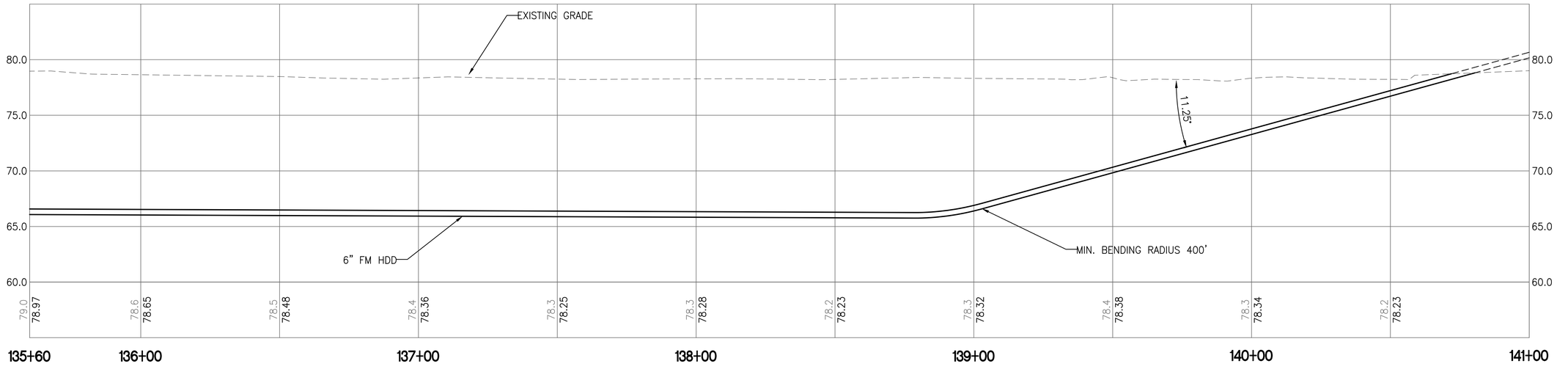
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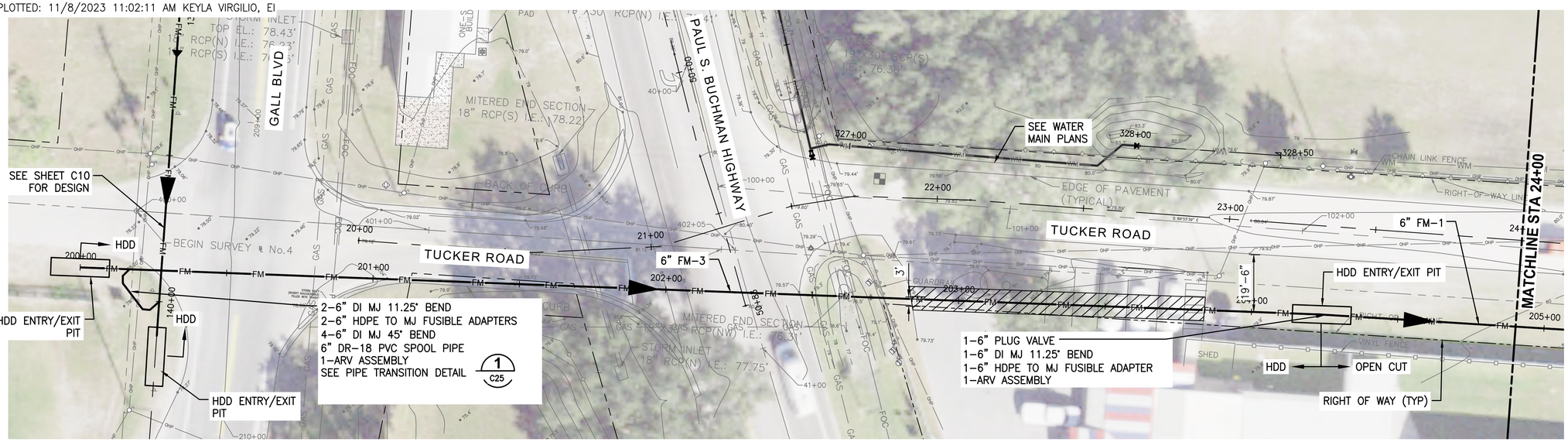
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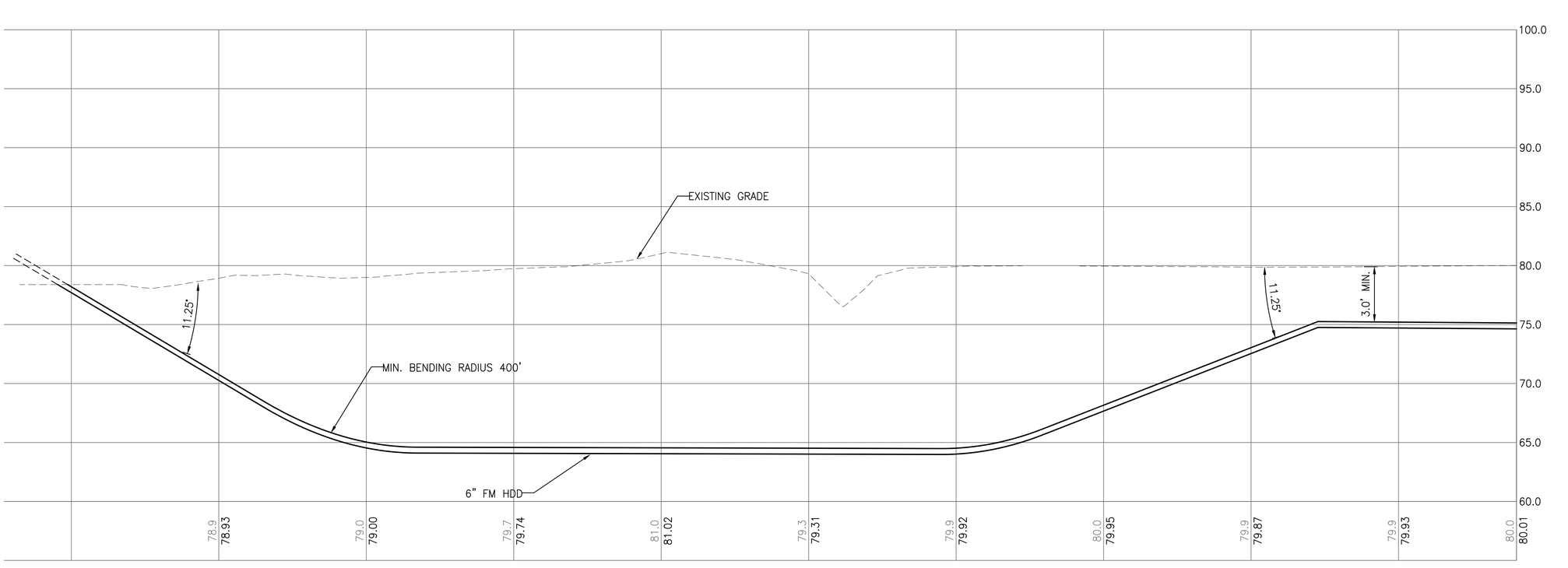
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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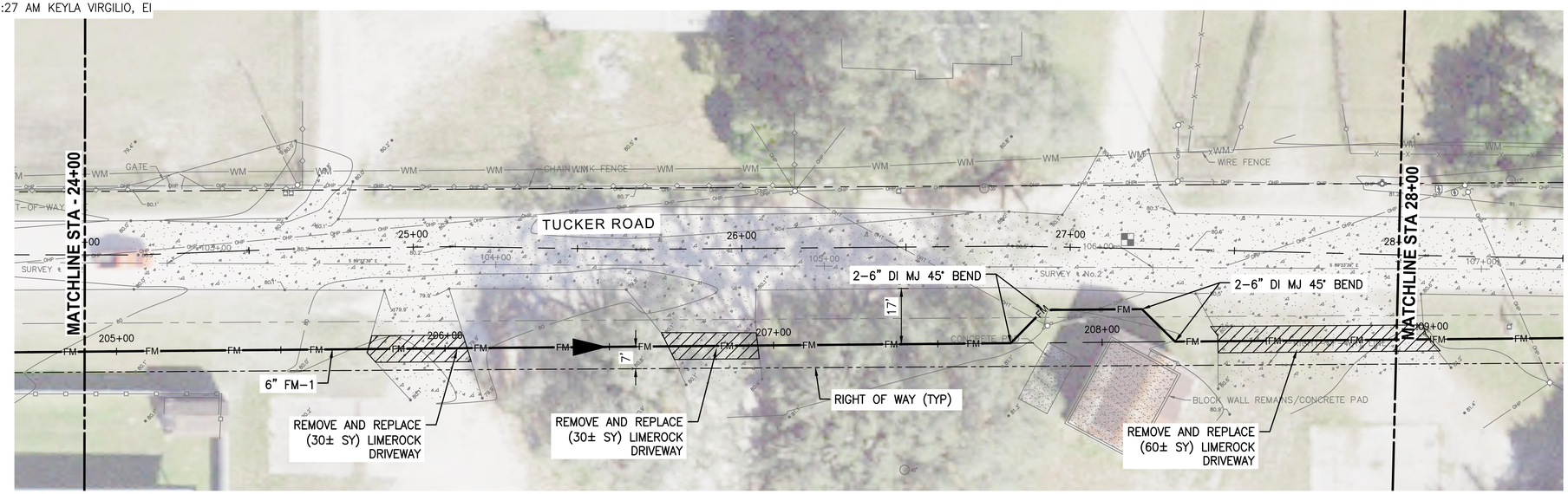
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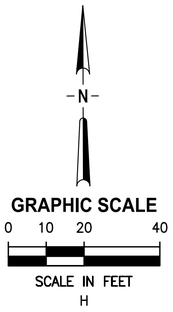
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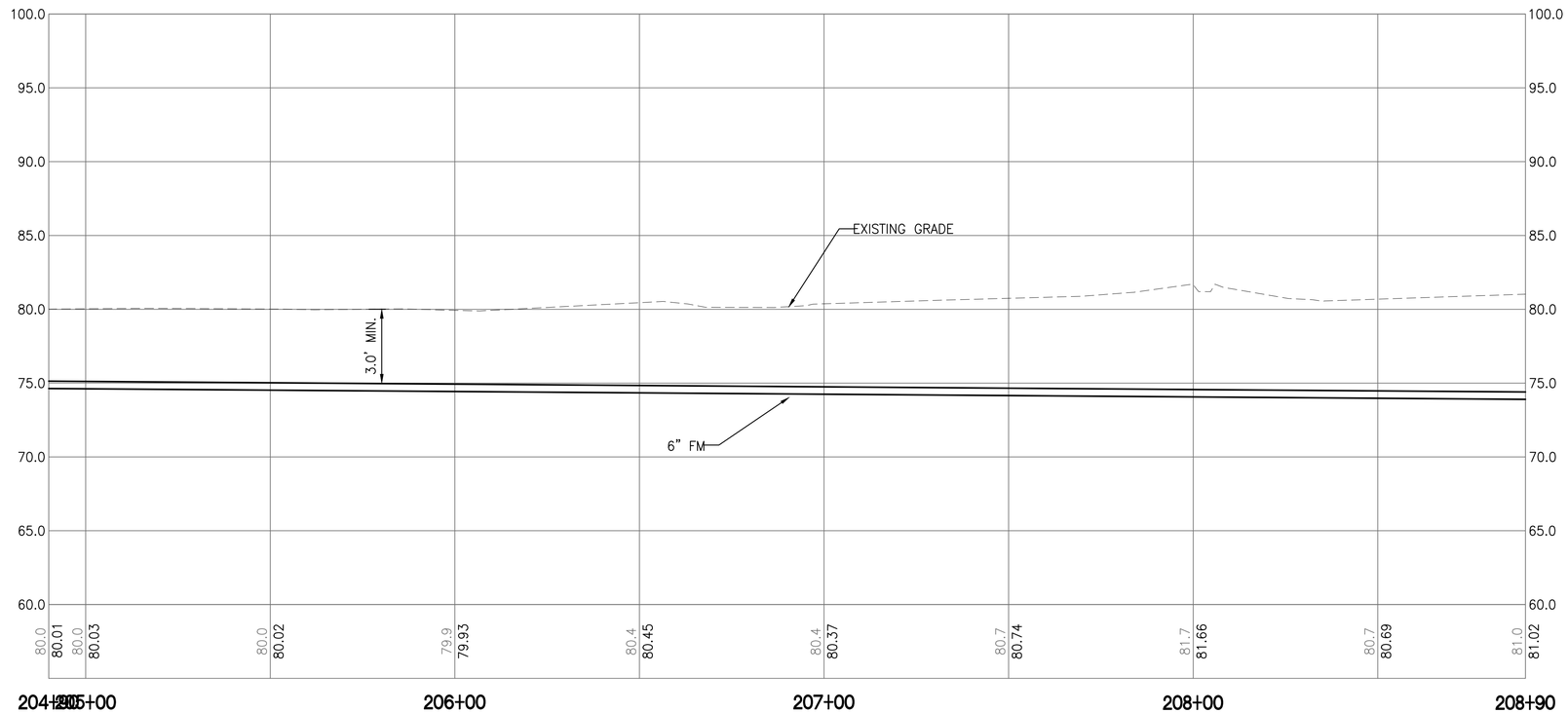
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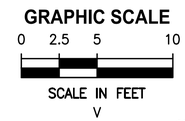
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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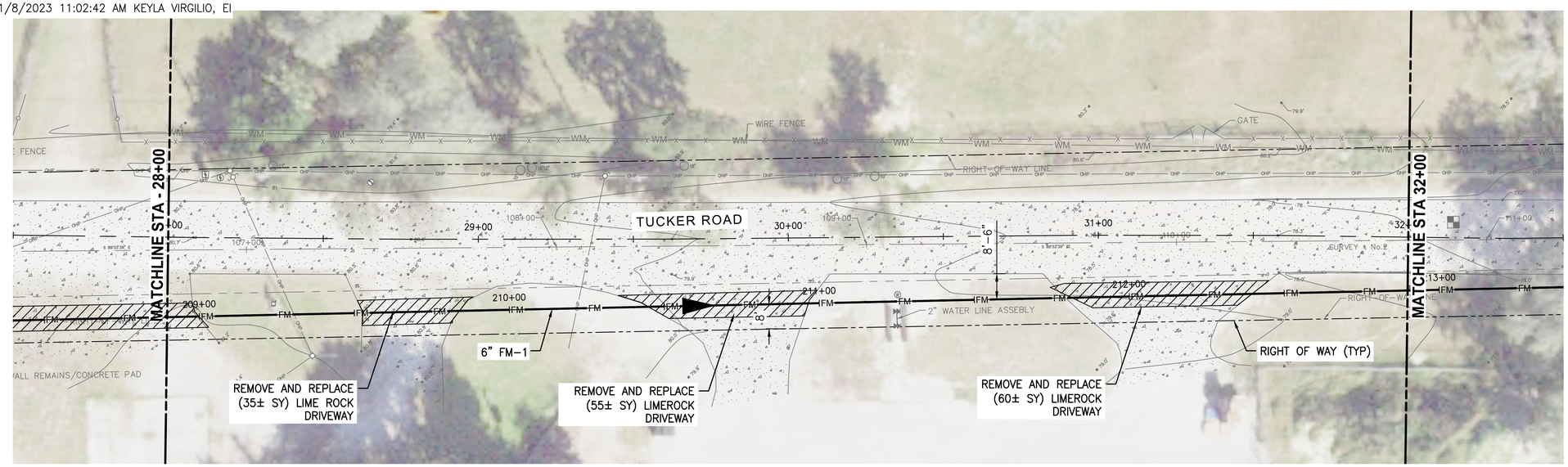
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INDEX NO:	DWG NO: C12

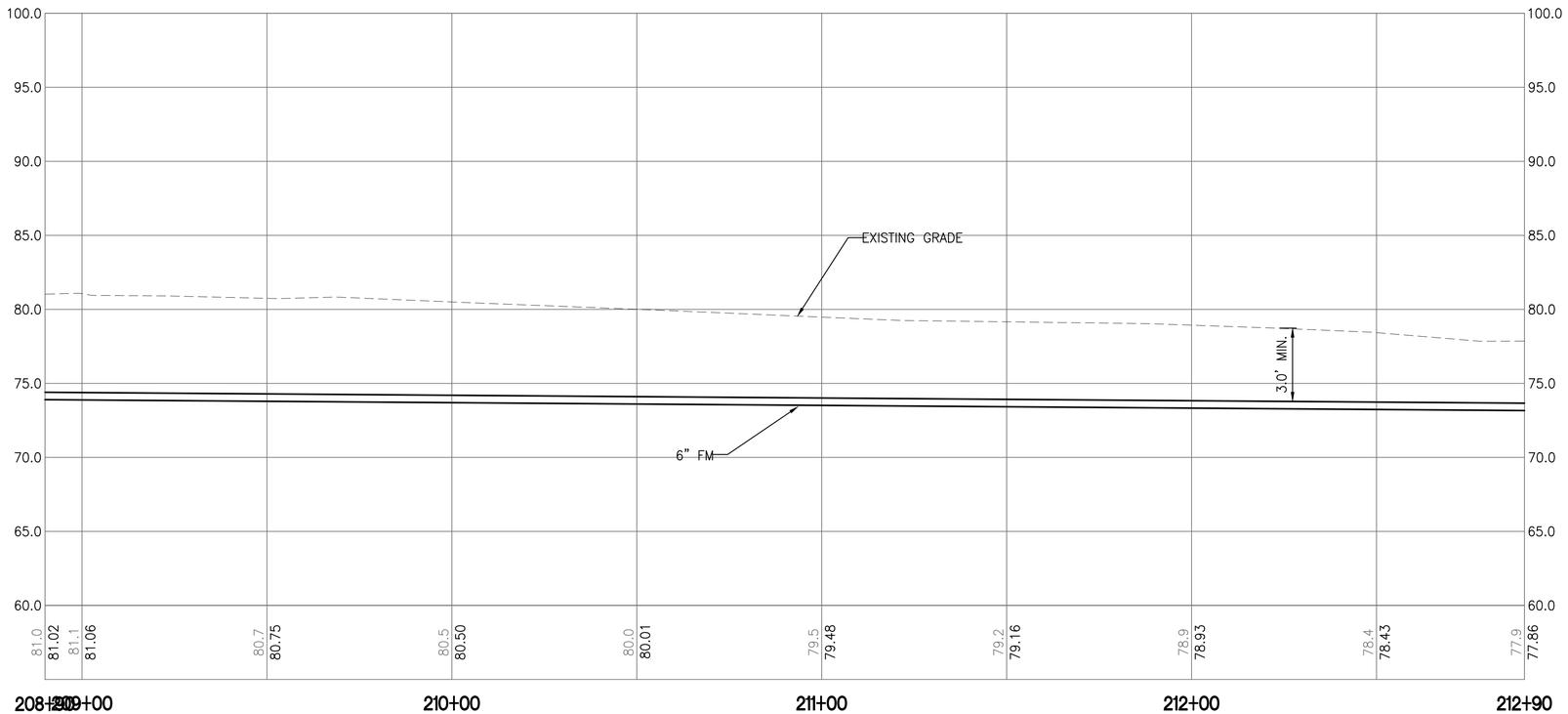
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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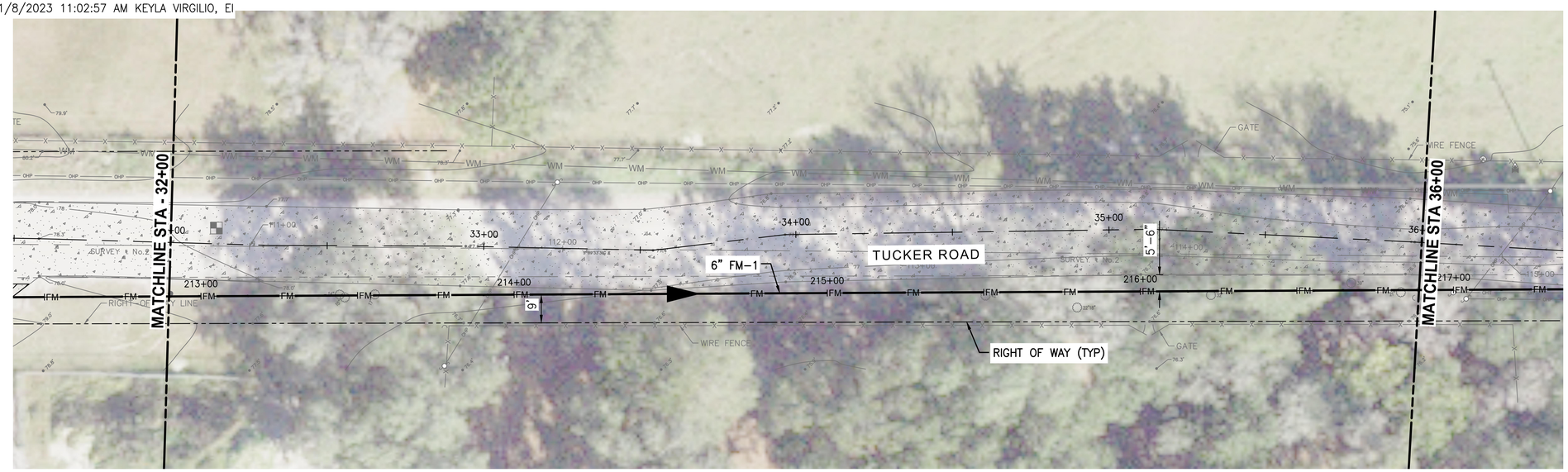
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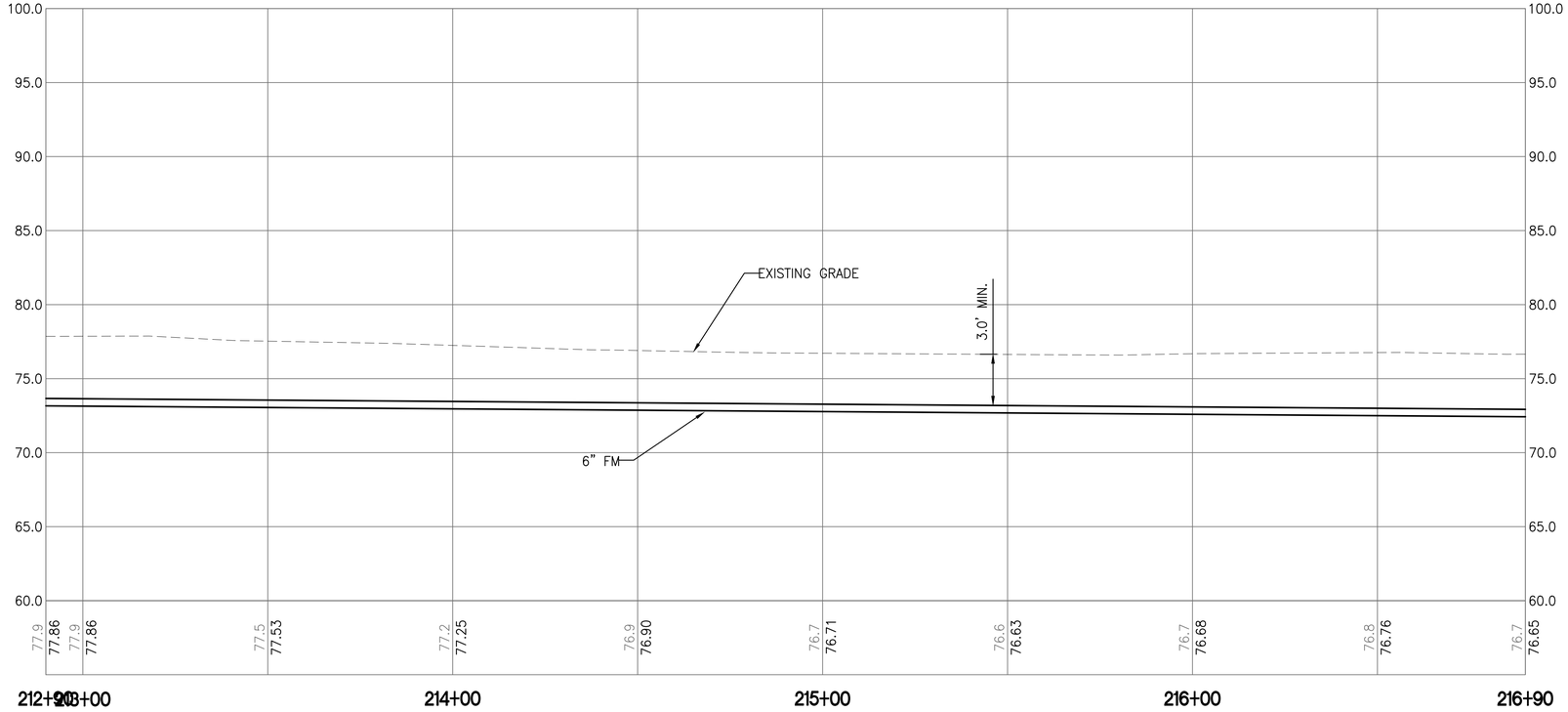
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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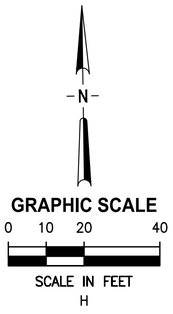
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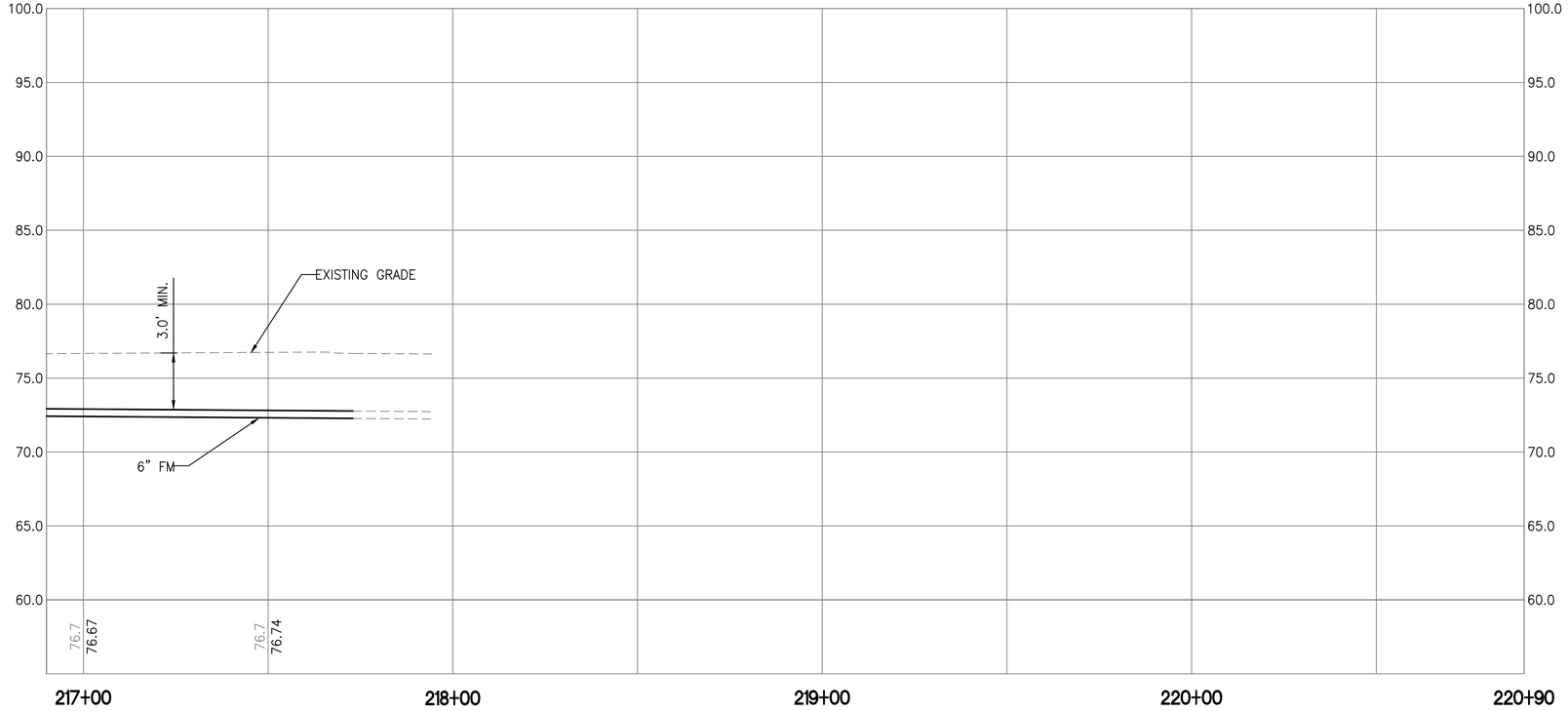
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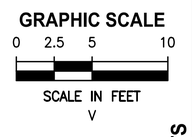
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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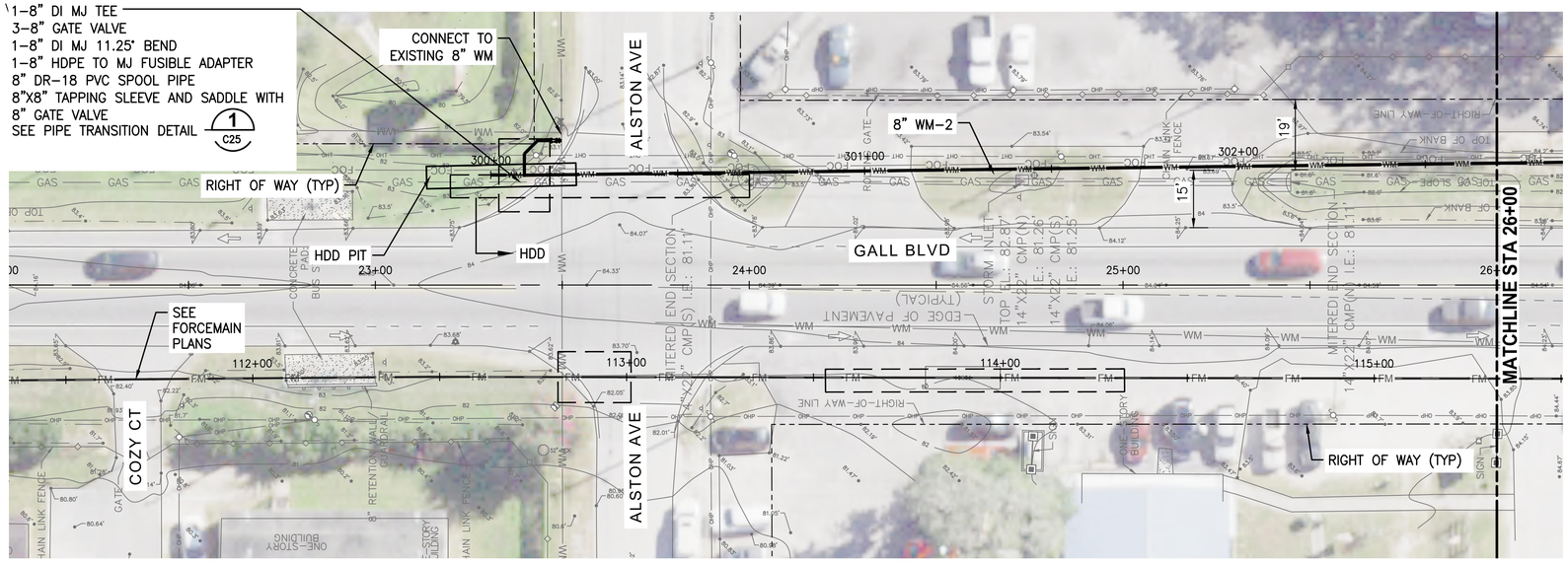
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INDEX NO:
DWG NO: C15

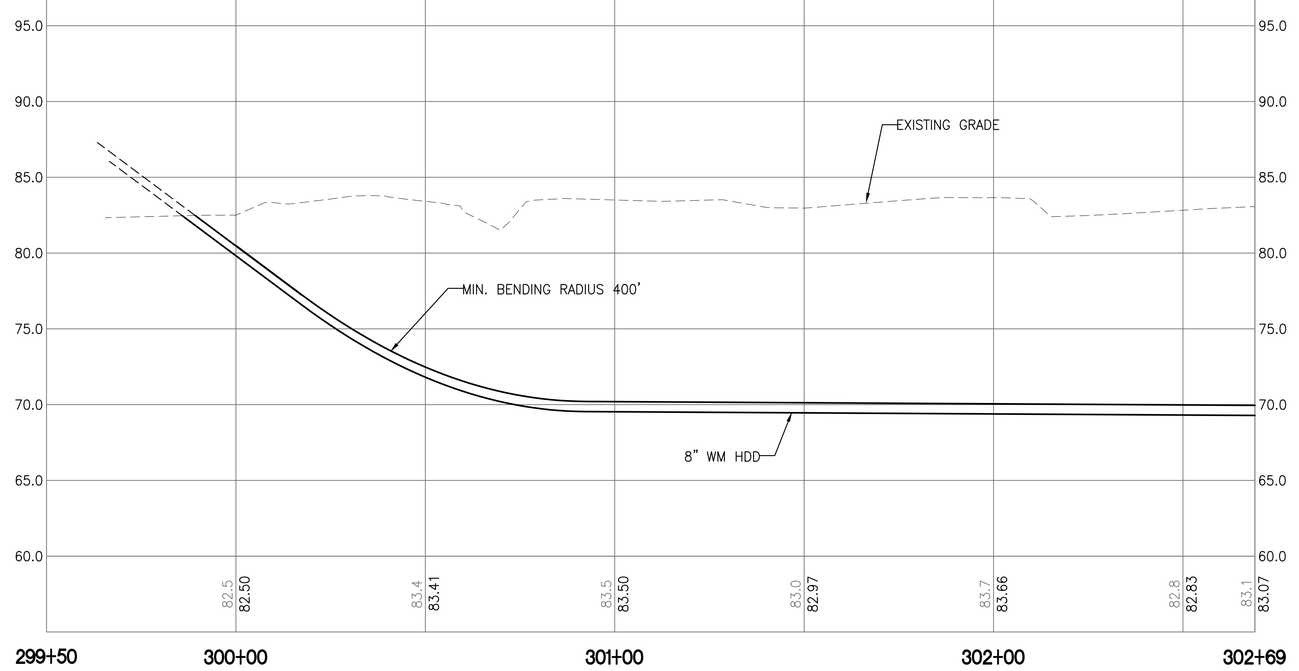
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1–8" DI MJ TEE
3–8" GATE VALVE
1–8" DI MJ 11.25° BEND
1–8" HDPE TO MJ FUSIBLE ADAPTER
8" DR–18 PVC SPOOL PIPE
8"X8" TAPPING SLEEVE AND SADDLE WITH 8" GATE VALVE
SEE PIPE TRANSITION DETAIL (1 / C25)



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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

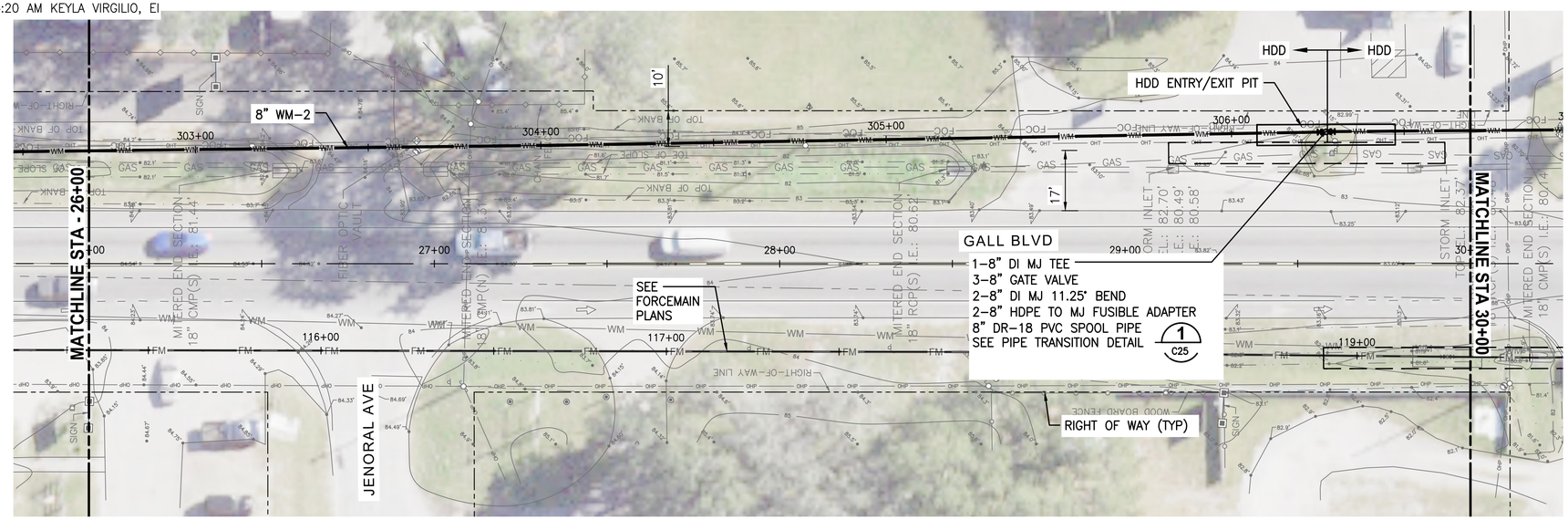
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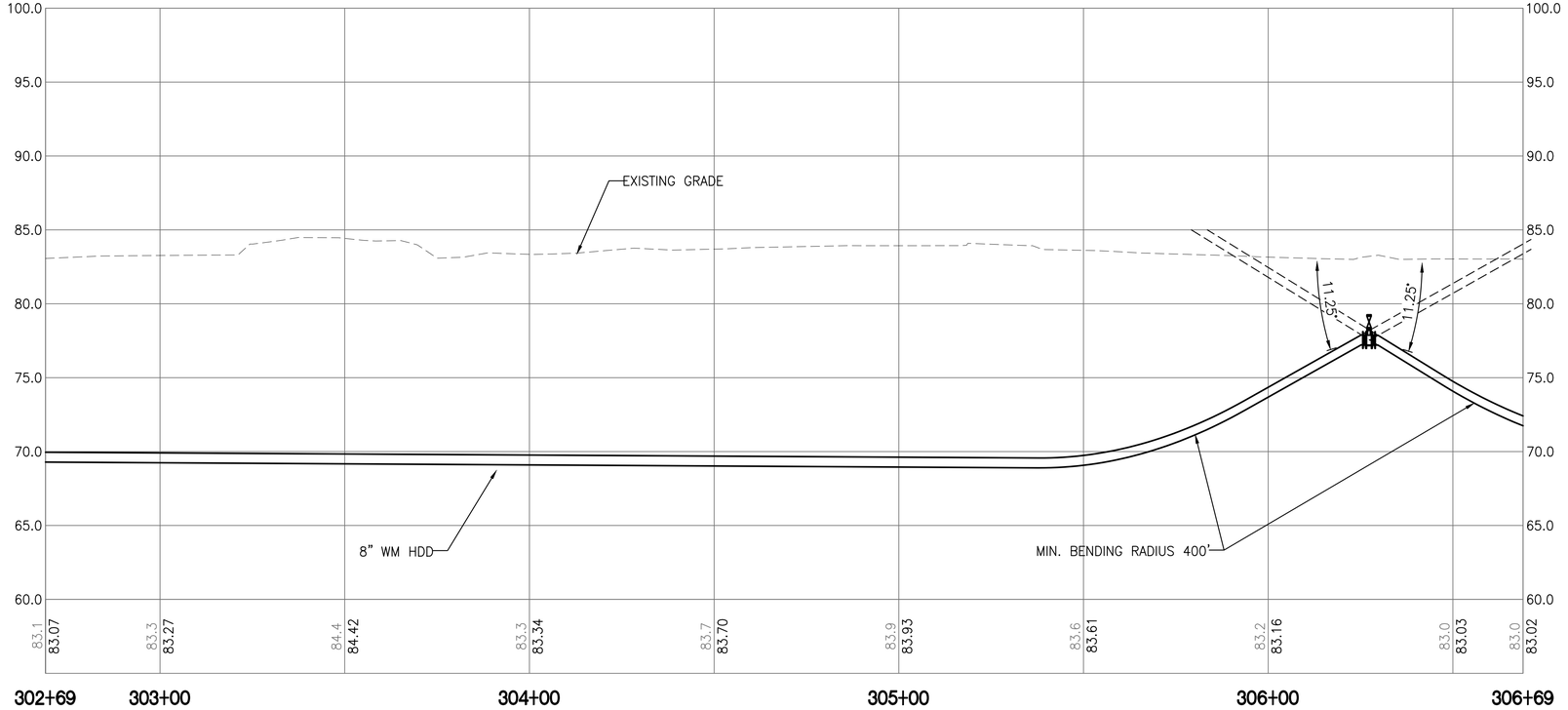
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

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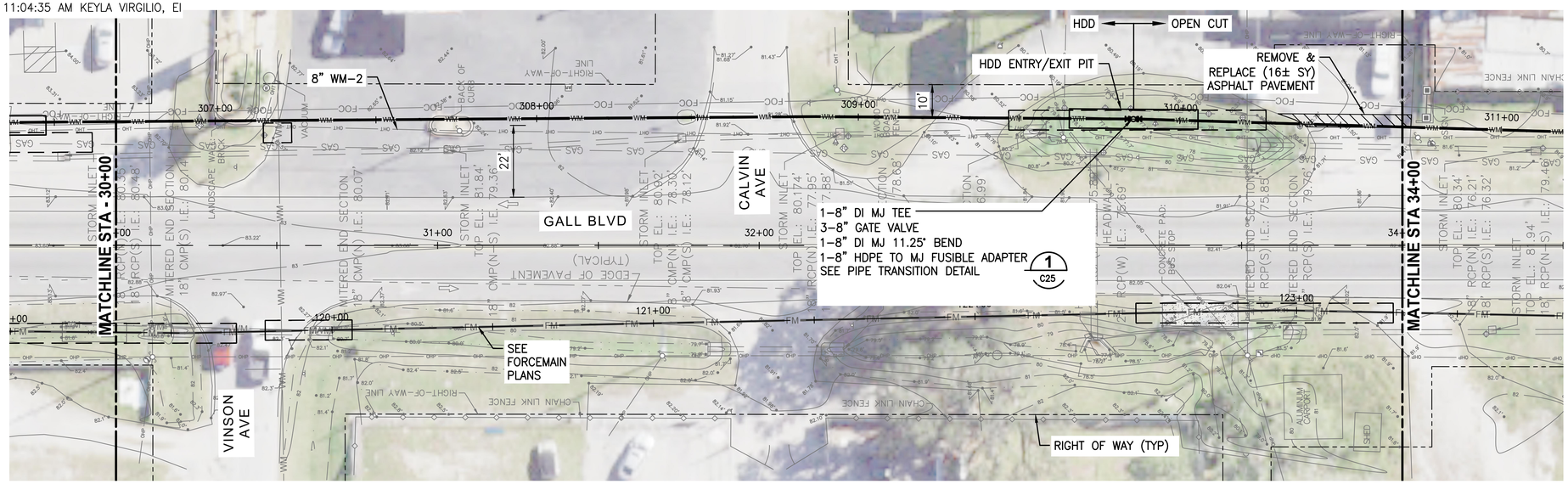
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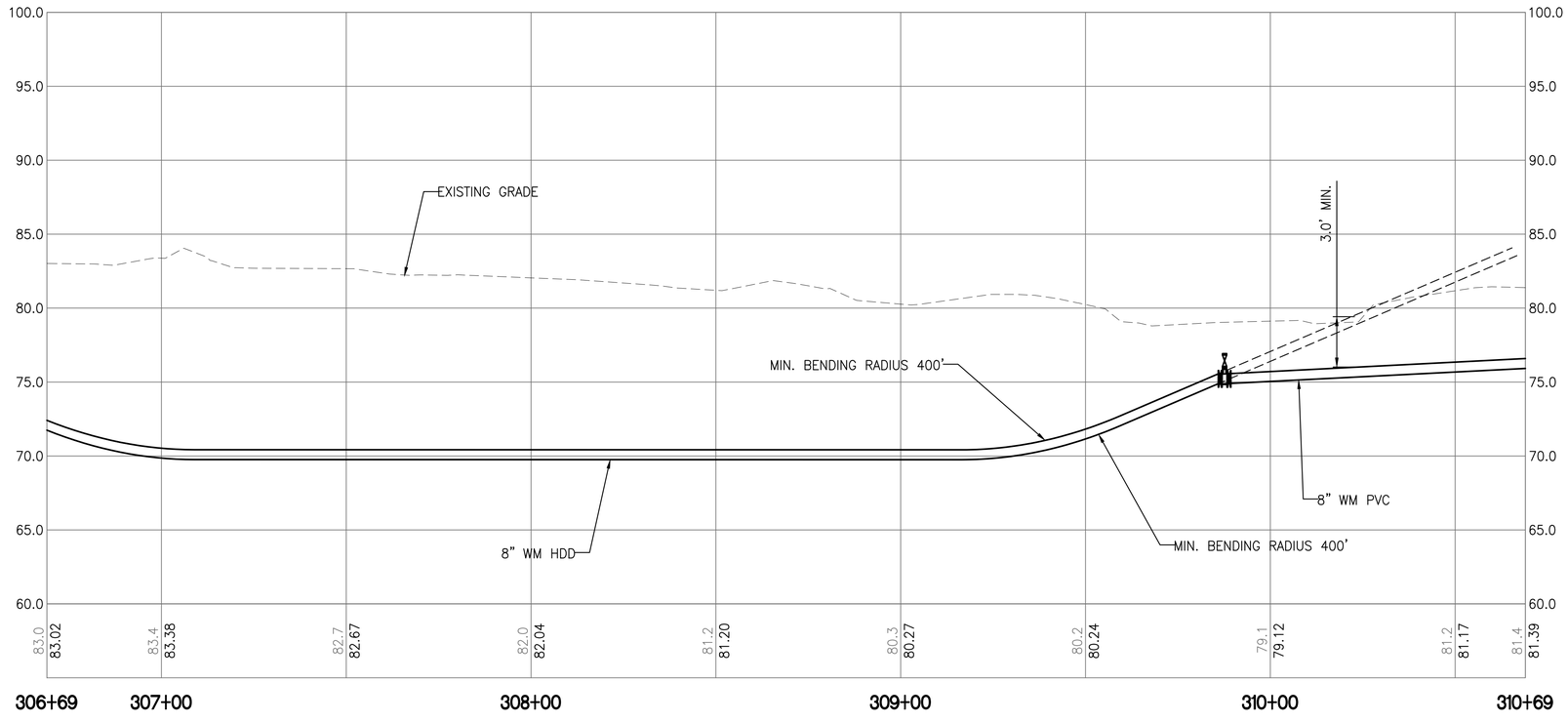
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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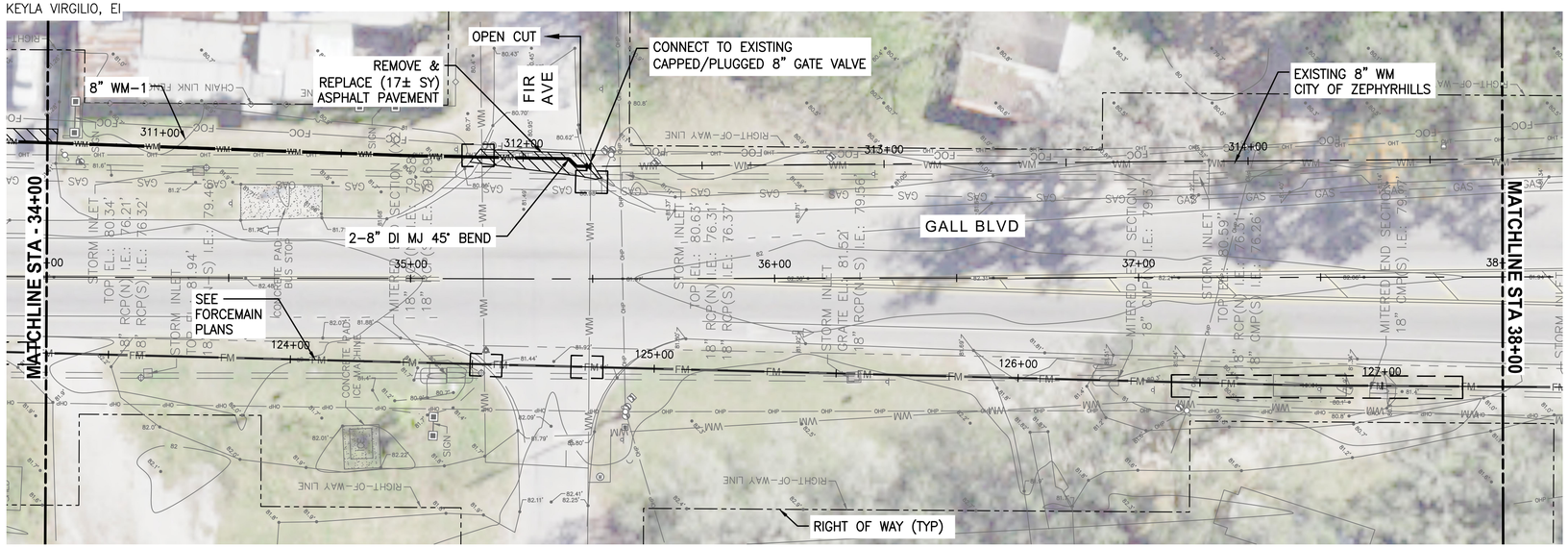
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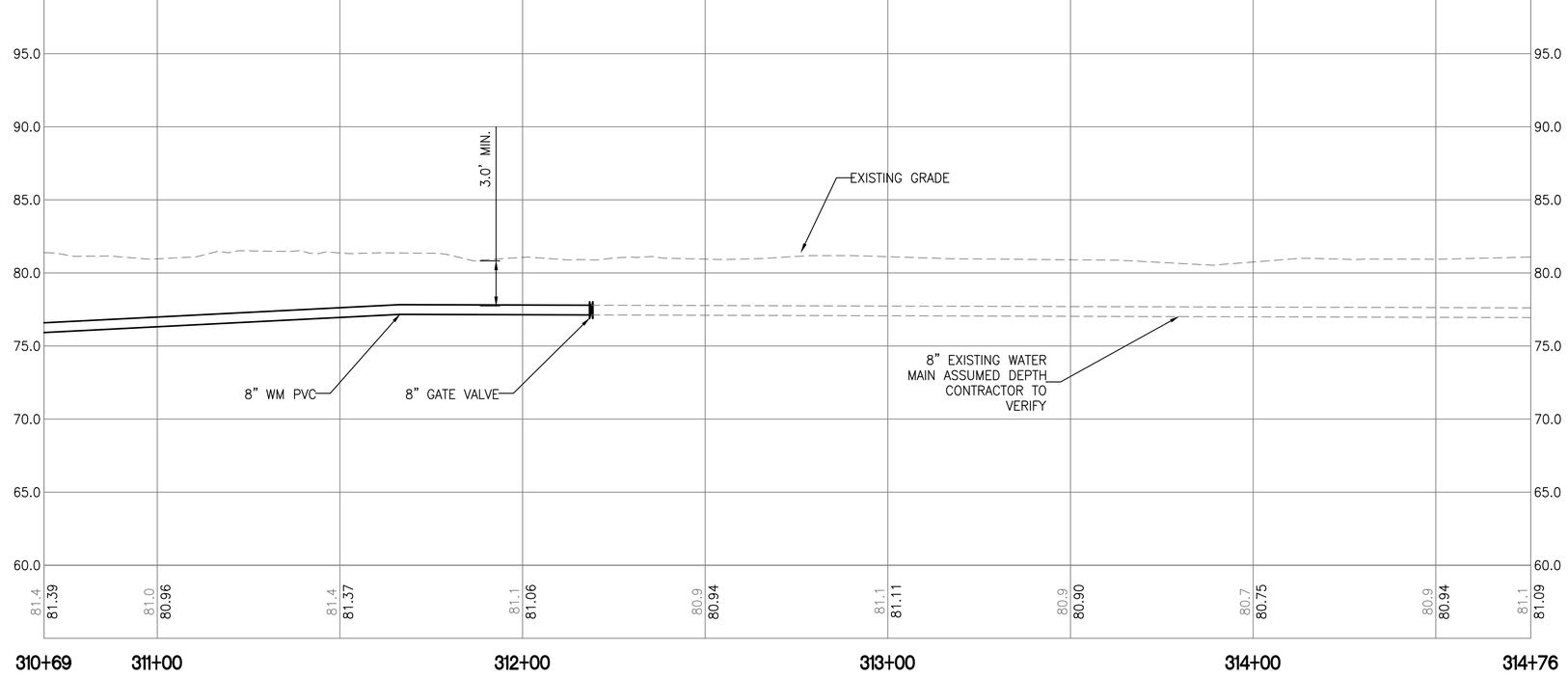
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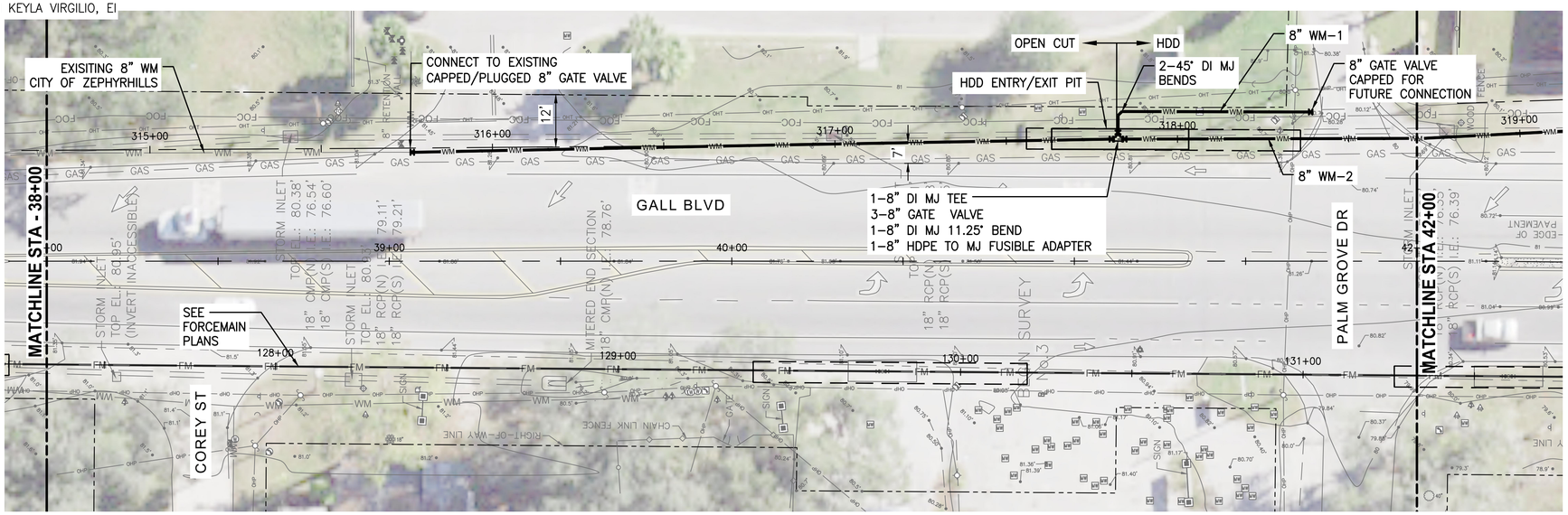
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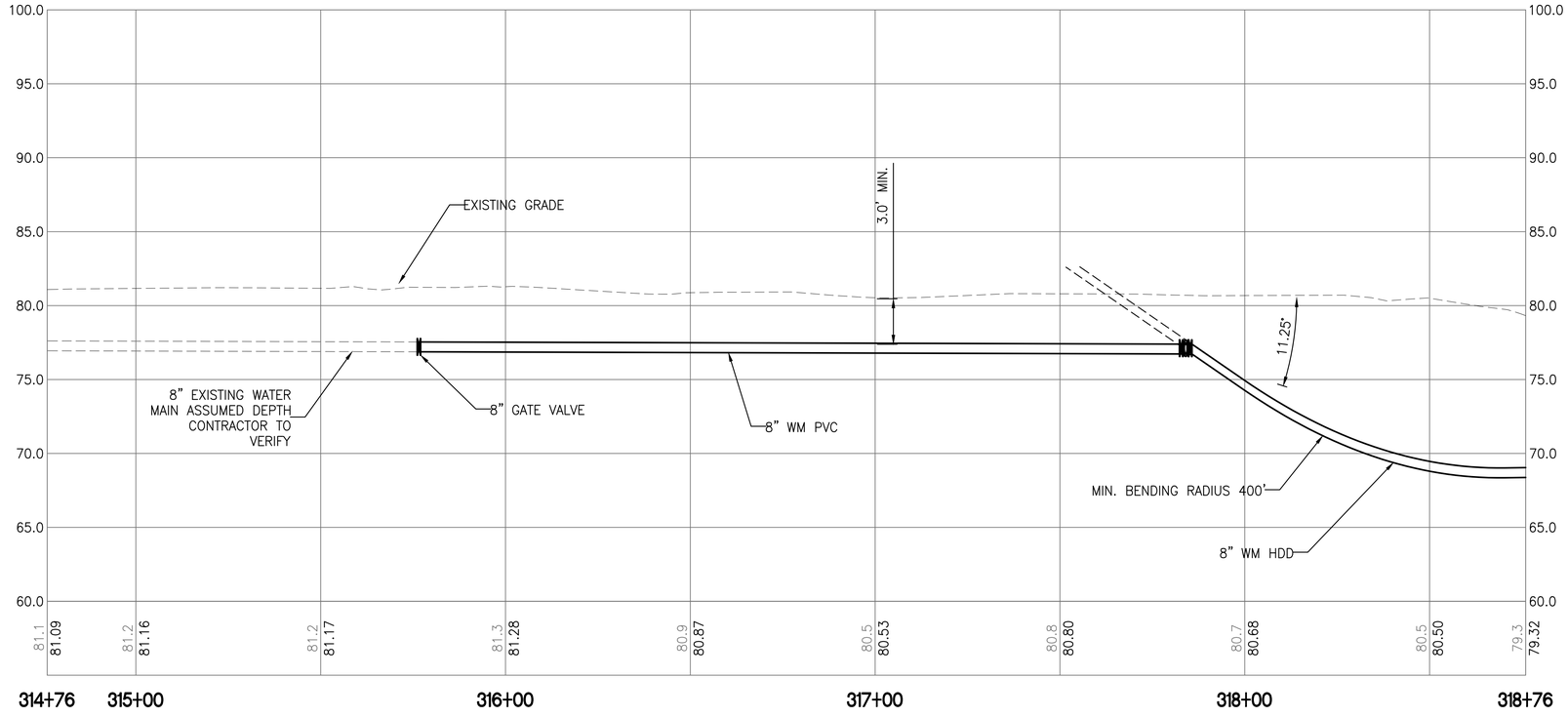
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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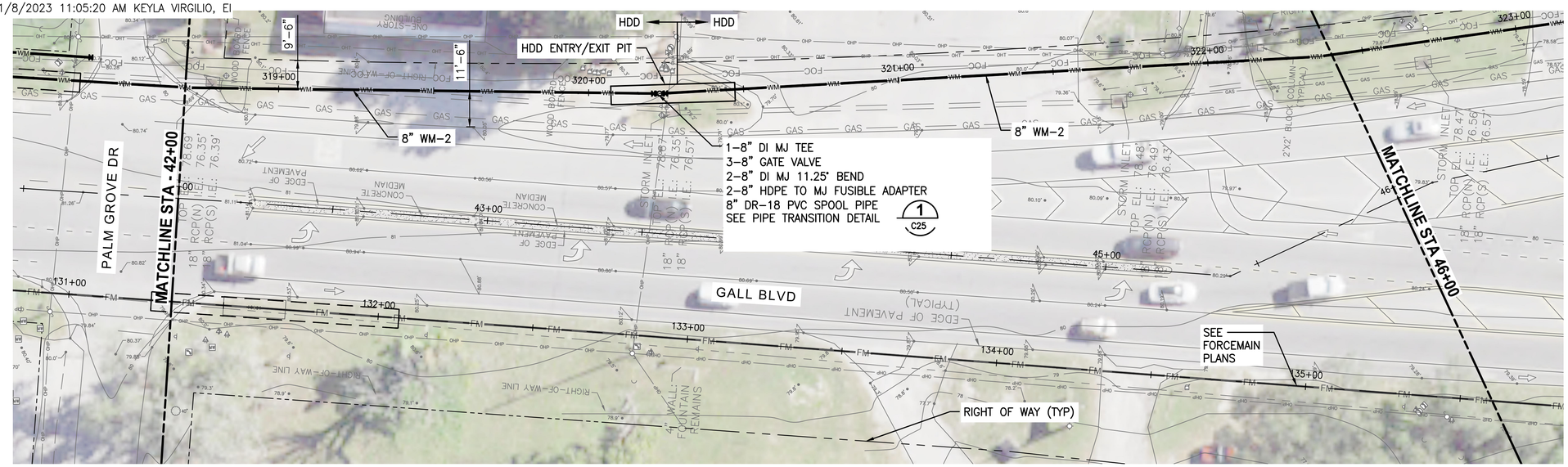
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

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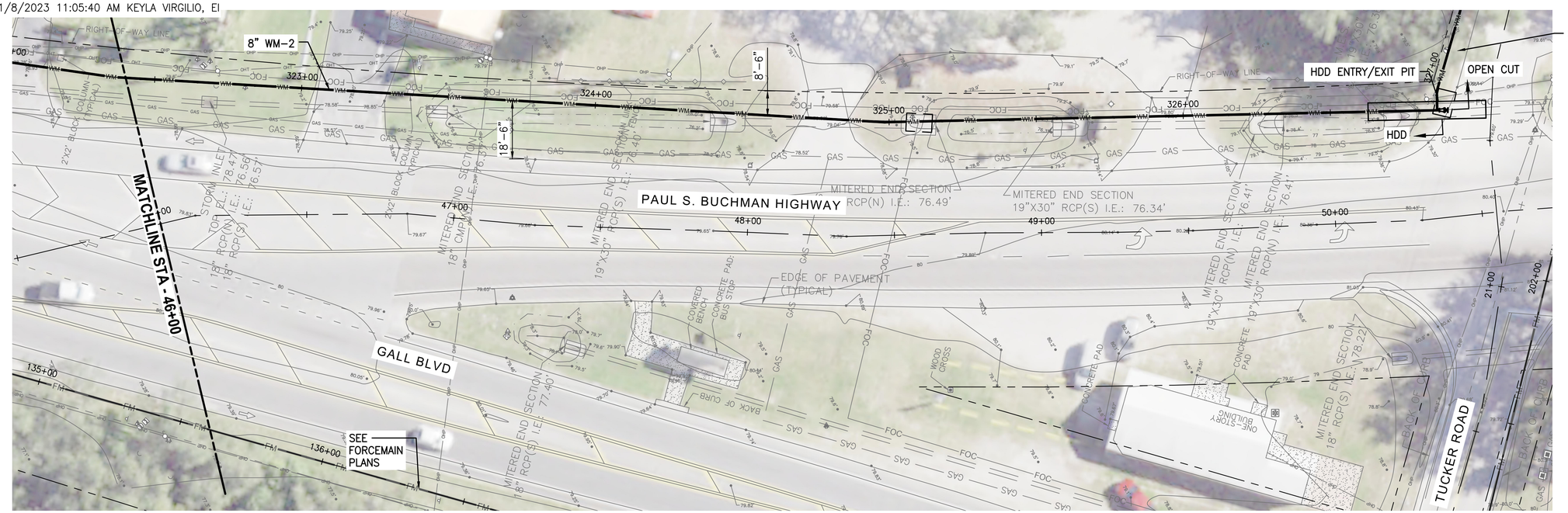
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PROJECT NO:	DATE:
26110-051-01	NOV. 2023
INDEX NO:	DWG NO: C21

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

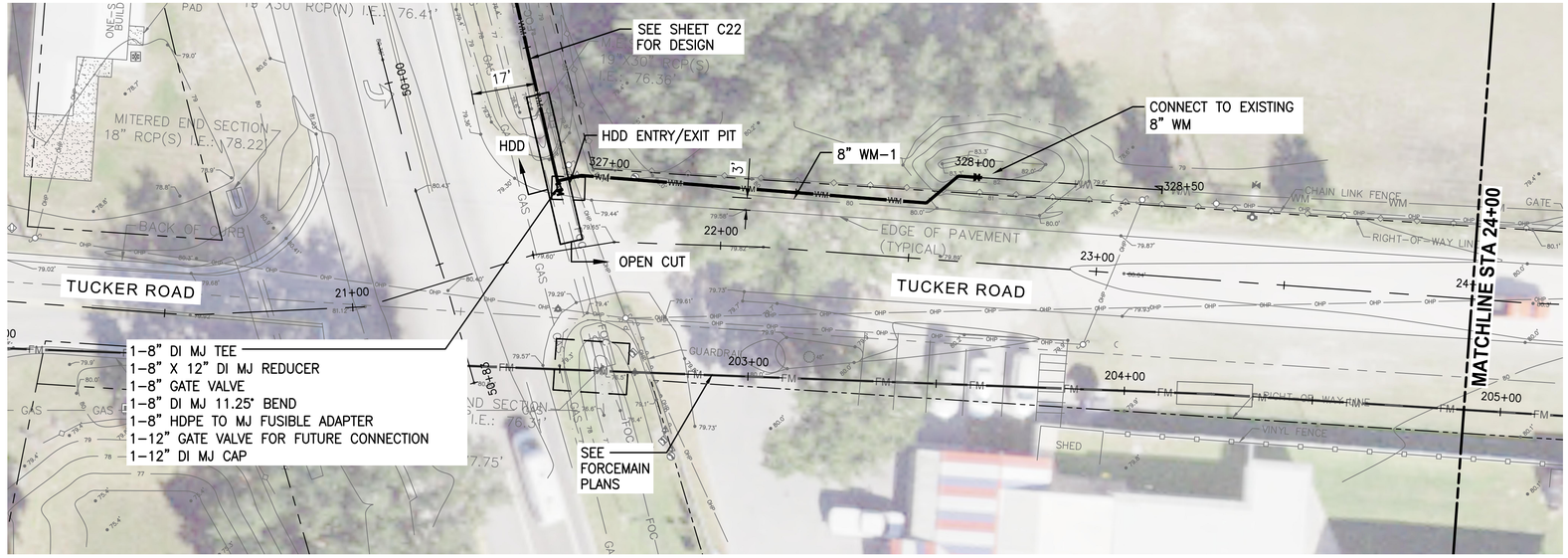
WATERMAIN PLANS

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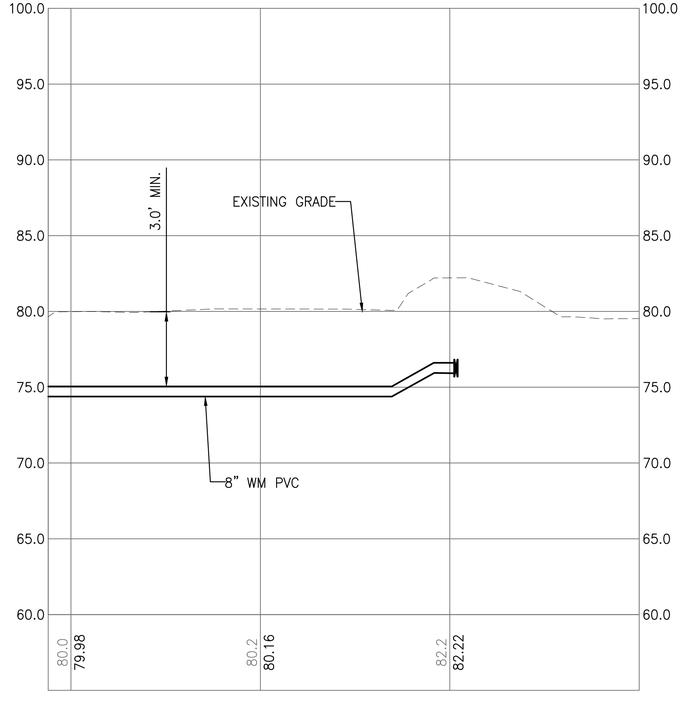
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SCALE IN FEET
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GRAPHIC SCALE
0 2.5 5 10
SCALE IN FEET
V

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8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

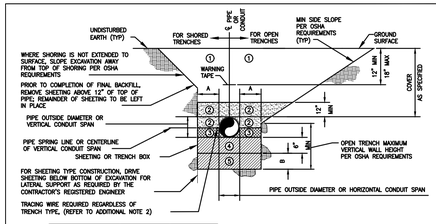
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NOMINAL PIPE DIAMETER OR HORIZONTAL CONDUIT SPAN (INCHES)	MINIMUM SIDEWALL CLEARANCE	ADDITIONAL EXCAVATION DEPTH (1)
	A (INCHES)	B (INCHES)
LESS THAN 24	12	12
24 AND GREATER	18	18

(1) REQUIRED WHERE UNSUITABLE MATERIAL IS ENCOUNTERED.

ZONE NO.	ZONE NAME	MATERIAL	COMPACTION
①	FINAL BACKFILL	AS SPECIFIED	AT LEAST 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY ASTM D-1557 (98% WHEN UNDER PAVEMENT)
②	INITIAL BACKFILL		
③	HAUNCHING		
④	BEDDING		
⑤	FOUNDATION		

TRENCH ZONE NOTES:

① FINAL BACKFILL SHALL BE INSTALLED IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. REFER TO ADDITIONAL NOTE 3.

② INITIAL BACKFILL SHALL BE INSTALLED IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HAND TAMPING OR AN APPROVED METHOD OF MECHANICAL TAMPING. REFER TO ADDITIONAL NOTE 3.

③ HAUNCHING SHALL BE IN COMPLETELY DEWATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HAND TAMPING. HAUNCHING SHALL BE BROUGHT UP EQUALLY ON BOTH SIDES OF THE PIPE.

④ BEDDING SHALL BE INSTALLED IN COMPLETELY DEWATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT, AND SHALL BE COMPACTED BY HAND OR MECHANICAL TAMPING. PROPERLY SHAPED BELL HOLES SHALL BE EXCAVATED IN THE BEDDING TO PERMIT ASSEMBLY OF THE PIPE. REFER TO ADDITIONAL NOTE 3.

⑤ NATIVE, UNDISTURBED MATERIAL IN COMPLETELY DEWATERED TRENCHES MEETING THE COMPACTION AND MATERIAL REQUIREMENTS FOR COMPACTED BEDDING MATERIAL NEED NOT BE REPLACED OR REWORKED, EXCEPT FOR SHAPING OF THE BELL HOLES, AND WHERE REFILL IS REQUIRED.

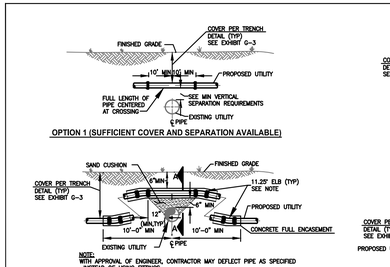
FOUNDATION SHALL BE REQUIRED WHERE UNSUITABLE MATERIAL IS ENCOUNTERED. FOUNDATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS FOR BEDDING. REFER TO ADDITIONAL NOTE 3.

ADDITIONAL NOTES:

1. FOR TRENCHES IN VEHICULAR TRAFFIC AREAS OR BENEATH SURFACE IMPROVEMENTS (EG, SLABS, ASPHALT, ETC.) SEE CONTRACT SPECIFICATIONS FOR ADDITIONAL COMPACTION REQUIREMENTS. SEE DRAWINGS FOR SURFACE IMPROVEMENT AND /OR RESTORATION DETAILS WHERE APPLICABLE.
2. TRACING WIRE SHALL BE INSTALLED ON THE SIDE OF THE PIPE AND ATTACHED TO THE PIPE EVERY 10' W/ A NYLON WIRE TIE. IF THE WIRE IS DAMAGED OR NEEDS TO BE EXTENDED A 3M WATERPROOF TYPE DF SPLICE SHALL BE INSTALLED TO REPAIR THE WIRE. THE ENDS OF THE TRACING WIRE SHALL BE BROUGHT UP IN EVERY VALVE BOX ON THE LINE AND AT THE HYDRANT VALVES. THERE SHALL BE A MINIMUM COIL OF 3' LEFT UNDER THE VALVE BOX COVER. THE WIRE SHALL BE TESTED TO VERIFY CONDUCTIVITY.
3. ALTERNATIVE LIFT THICKNESSES, NOT EXCEEDING 12 INCHES LOOSE MEASUREMENT, ARE ACCEPTABLE IN TRENCH ZONES 1, 2, 4, AND 5 PROVIDED 1) THE LIFT THICKNESS DOES NOT EXCEED THE MAXIMUM VALUE RECOMMENDED IN WRITING BY THE APPLICABLE PIPE MANUFACTURER AND 2) FIELD TEST RESULTS CONFIRM THAT THE SPECIFIED COMPACTION REQUIREMENTS ARE BEING MET.

TYPICAL UTILITY TRENCH DETAIL
NTS

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613
NOVEMBER 2021
G-3



OPTION 1 (SUFFICIENT COVER AND SEPARATION AVAILABLE)

NOTE:
WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

ALTERNATE OPTION 1 (SUFFICIENT COVER OR SEPARATION NOT AVAILABLE)

PROPOSED UTILITY	MINIMUM VERTICAL SEPARATION REQUIREMENTS						
	POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS	COMMENTS
POTABLE WATER	1'-0"	1'-0"(1,2)	1'-0"(1,2)	1'-0"(1)	1'-0"	1'-0"	SEE NOTE 1
GRAVITY SANITARY SEWER	1'-6"(2)	1'-0"	1'-0"	1'-6"	1'-0"(2)	1'-0"	
SEWAGE FORCE MAIN	1'-6"(2)	1'-0"	1'-0"	1'-6"	1'-0"(2)	1'-0"	SEE NOTE 2
STORM	1'-0"(1)	1'-6"	1'-0"	1'-0"	1'-0"	1'-0"	
RECLAIMED WATER	1'-0"	1'-6"	1'-6"	1'-0"	1'-0"	1'-0"	SEE NOTE 2
ELECTRIC TELECOMMUNICATIONS	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	

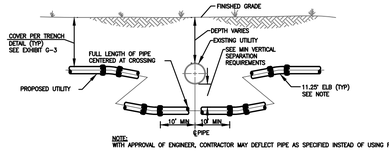
(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

NOTES:
1. ONLY OPTION 1 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.
2. ONLY OPTION 2 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.

PROPOSED UTILITY	MINIMUM HORIZONTAL SEPARATION EXISTING UTILITY					
	POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS
POTABLE WATER	1'-0"	10'-0"(1,2)	10'-0"(1,2)	3'-0"(1)	3'-0"(1,3)	3'-0"
GRAVITY SANITARY SEWER	10'-0"(2)	1'-0"	1'-0"	3'-0"	3'-0"(2)	3'-0"
SEWAGE FORCE MAIN	10'-0"(2)	1'-0"	1'-0"	3'-0"	3'-0"(2)	3'-0"
STORM	3'-0"(1)	3'-0"	3'-0"	1'-0"	3'-0"	3'-0"
RECLAIMED WATER	3'-0"(1,3)	3'-0"(2)	3'-0"(2)	3'-0"	1'-0"	3'-0"
ELECTRIC TELECOMMUNICATIONS	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	2'-0"

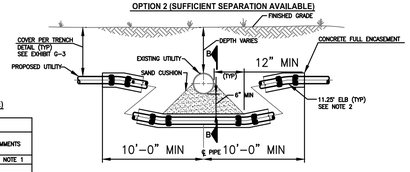
(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

NOTE:
UTILITIES SHALL NOT BE INSTALLED WITHIN THE DRIP LINE OF TREES WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.



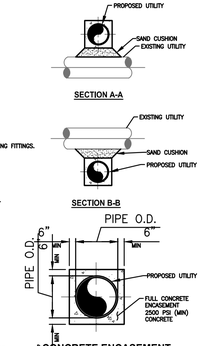
NOTE:
WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

OPTION 2 (SUFFICIENT SEPARATION AVAILABLE)



NOTES:
1. FOR PROPOSED WATER MAINS, THIS OPTION IS ONLY ALLOWED WITH APPROVAL OF THE ENGINEER AND FDEP ON A CASE BY CASE BASIS.
2. WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

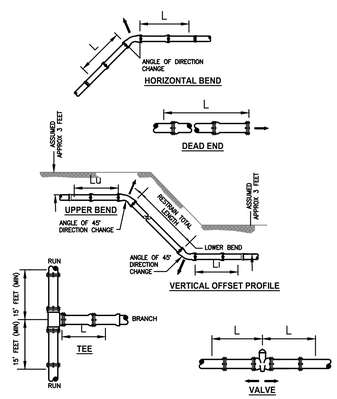
ALTERNATE OPTION 2 (SUFFICIENT SEPARATION NOT AVAILABLE)



UTILITY CONFLICT

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
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NOVEMBER 2021
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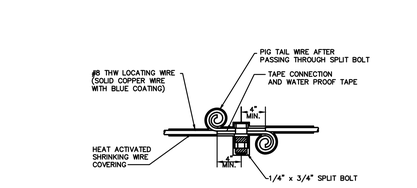
NOTE:
THE INFORMATION SHOWN ABOVE IS PROVIDED BY THE CITY OF ZEPHYRHILLS. THIS DOES NOT REPRESENT THE WORK PRODUCT OF JONES EDMUNDS AND ASSOCIATES, INC. THEY ARE PROVIDED FOR REFERENCE ONLY AND TO ENSURE COMPLIANCE WITH THE CITY OF ZEPHYRHILLS STANDARDS. UNLESS MODIFIED BY THESE CONTRACT DOCUMENTS, THESE DETAILS WILL BE THE MINIMUM STANDARDS.



NOMINAL SIZE	VALVES OR DEAD-ENDS	HORIZONTAL BENDS			VERTICAL OFFSET		TEES			REDUCERS	
		90° BENDS	45° BENDS	22.5° BENDS	11.25° BENDS		RUN SIZE	BRANCH SIZE	L (FT)	RUN SIZE	L (FT)
					Lu	Ll					
10	84	37	16	85	4	35	16	10	≤10	27	12 TO 10	29
12	99	43	18	9	5	41	18	12	≤12	41		

NOTES:
1. THE SCHEDULE SHOWN IS FOR THE FOLLOWING SERVICE CONDITIONS: 150 PSIG; SPECIFIED TRENCH ZONE MATERIAL; 36 INCHES COVER; TYPE 3 LAYING CONDITIONS; AND 1.5 SAFETY FACTOR.
2. RESTRAINED LENGTHS SHOWN IN TABLE ARE IN FEET AND ARE MINIMUM LENGTHS REQUIRED IN EACH DIRECTION FROM FITTING OR VALVES.
3. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING RESTRAINED JOINTS.
4. ALL PIPE SHALL BE RESTRAINED TO THE NEXT JOINT BEYOND THE RESTRAINED LENGTH GIVEN.
5. EACH SIDE OF HDPE TRANSITION FITTINGS SHALL BE RESTRAINED PER THE RESTRAINED JOINT SCHEDULE AS AN IN-LINE VALVE.

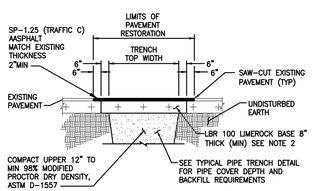
TYPICAL RESTRAINED JOINT DETAIL
NTS



NOTES:
1. THE ENDS OF ALL LOCATING WIRES, WHETHER THEY ARE SPLICED, CONNECTED, OR TERMINATED, SHALL HAVE THE LAST THREE INCHES PIG TAILED AS DETAILED HEREON.
2. AFTER INSTALLATION OF THE LOCATING WIRE THE SYSTEM SHALL BE SUBJECTED TO TESTING, IN THE PRESENCE OF CITY UTILITIES STAFF PRIOR TO BACKFILL, IN ORDER TO THAT THE SYSTEM IS FUNCTIONAL.

LOCATING WIRE SPLICING
NOT TO SCALE

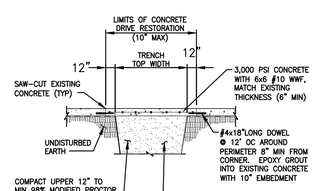
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CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613
NOVEMBER 2021
G-8



NOTES:
1. ASPHALT PAVEMENT RESTORATION DETAIL APPLIES TO CITY ROADS, DRIVEWAYS, PRIVATE ROADS, DRIVES, MISCELLANEOUS PATCHES, AND SIMILAR RESTORATION.
2. NEW LIMEROCK TO BE COMPACTED TO NOT LESS THAN 98% MODIFIED PROCTOR DRY DENSITY, ASTMD-1557.
3. FOR COUNTY ROADS AND STATE ROADS, DESIGN SHALL BE IN COMPLIANCE WITH PASCO COUNTY STANDARDS AND FDOT STANDARDS RESPECTFULLY.

ASPHALT PAVEMENT RESTORATION
NTS

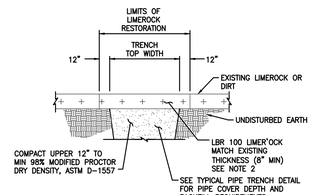
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NOTES:
MATCH EXISTING GRADE AND FINISH.

CONCRETE DRIVE RESTORATION
NTS

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39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
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NOVEMBER 2021
G-9A



NOTES:
1. LIMEROCK PAVEMENT RESTORATION DETAIL APPLIES TO COUNTY ROADS, DRIVEWAYS, PRIVATE ROADS, DRIVES, MISCELLANEOUS PATCHES, AND SIMILAR RESTORATION.
2. NEW LIMEROCK TO BE COMPACTED TO NOT LESS THAN 98% MODIFIED PROCTOR DRY DENSITY, ASTMD-1557.

LIMEROCK RESTORATION
NTS

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NOVEMBER 2021
G-9B

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

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DRAWN S SIMS
CHECKED D PLAVCAN

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730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

CIVIL DETAILS

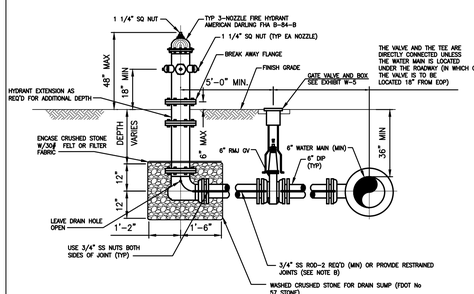
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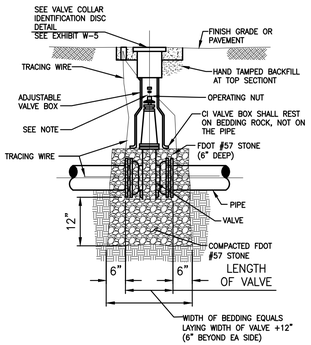
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NOTES:
A. FIRE HYDRANT INSTALLATION SHALL BE IN ACCORDANCE WITH THE CITY'S LAND DEVELOPMENT CODE.
B. 3/4" STAINLESS STEEL ROD CUT AND THREADED AS REQUIRED, OR PROVIDE RESTRAINED JOINTS.
C. FIRE HYDRANTS SHALL BE INSTALLED BETWEEN 3' AND 7' FROM EDGE OF PAVEMENT.
D. TIE RODS, NUTS, WASHERS AND OTHER FASTENERS SHALL BE GALVANIZED OR TYPE 316 STAINLESS STEEL.
E. 4 1/2" PUMPER NOZZLE TO BE PERPENDICULAR TO CENTERLINE OF MAJOR STREET.
F. FIRE HYDRANT ASSEMBLY INCLUDES ALL THAT IS SHOWN INCLUDING DI PIPE TO R/W, DIP TEE AT MAIN, HYDRANT, REDUCERS, VALVE, HYDRANT EXTENSIONS, VALVE EXTENSIONS, ALL PIPING AND MISCELLANEOUS APPURTENANCES REQUIRED FOR A COMPLETE INSTALLATION.
G. FOR FIRE HYDRANTS ALONG PAVED ROADWAYS, INSTALL RAISED PAVEMENT MARKER FOR FIRE HYDRANT IDENTIFICATION. MARKER SHALL BE BLUE AND IN ACCORDANCE WITH FDOT 706. MARKER SHALL BE LOCATED IN THE CENTER OF CLOSEST LANE PERPENDICULAR TO FIRE HYDRANT.

FIRE HYDRANT DETAIL
NTS

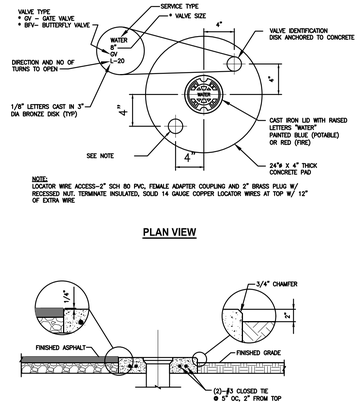
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PHONE (813)780-0029 FAX (813)780-0613
NOVEMBER 2021
W-10



NOTES:
1. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.
2. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.

GATE VALVE BOX
NTS

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W-3

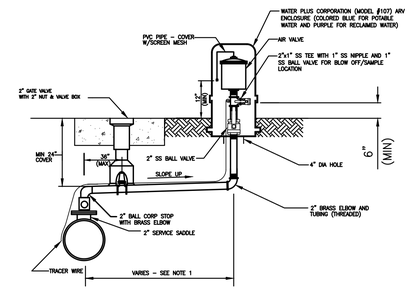


NOTE:
LOCATOR WIRE ACCESS-2" SCH 80 PVC, FEMALE ADAPTER COUPLING AND 2" BRASS PLUG W/ RECESSED NUT. TERMINATE INSULATED, SOLID 14 GAUGE COPPER LOCATOR WIRES AT TOP W/ 12" OF EXTRA WIRE

PLAN VIEW

VALVE COLLAR AND IDENTIFICATION DISK
NTS

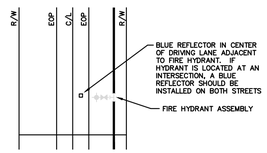
CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613
NOVEMBER 2021
W-5



NOTES:
1. OFFSET DISTANCE SHOWN ON DRAWINGS.
2. ADJUST HORIZONTAL LOCATION OF ARV ENCLOSURE, AS REQUIRED TO AVOID SIDEWALK. LOCATE ARV ENCLOSURE WITHIN 1' OF R/W OR AS OTHERWISE DETERMINED BY THE CITY.

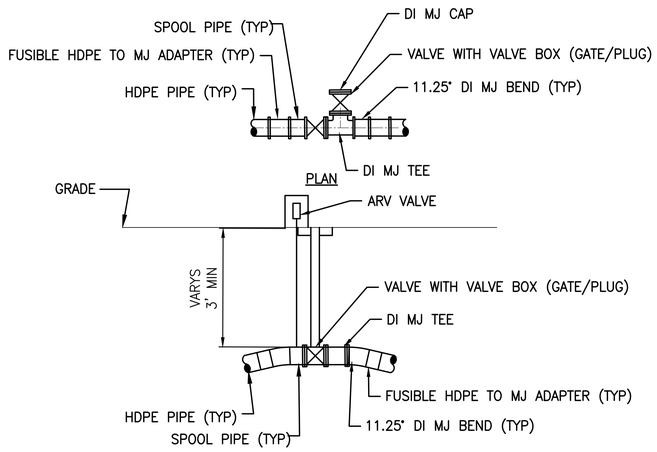
OFFSET AIR VALVE DETAIL
NTS

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NOVEMBER 2021
W-13



FIRE HYDRANT REFLECTOR DETAIL
NOT TO SCALE

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W-11

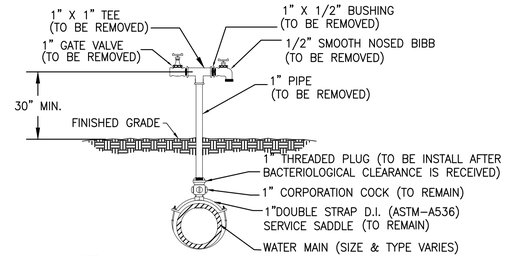


SECTION

PIPE TRANSITION DETAIL
NTS

1

NOTES:
(1) ALL CONNECTIONS SHALL BE RESTRAINED.
(2) FITTING CALLOUTS AS SHOWN IN DETAIL ARE FOR CONCEPTUAL PURPOSES. SEE PLANS FOR SPECIFIC FITTING AND PIPE CALLOUTS AT PIPE TRANSITIONS AND OTHER LOCATIONS.



NOTE:
1) LOCATION OF SAMPLE POINT BIBB SHALL NOT BE WITHIN THE ROADWAY BUT ROUTED TO THE ROADWAY SHOULDERS (NON-TRAFFIC AREAS) OF THE ROAD (WHERE APPLICABLE)
2) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL PIPING & FITTINGS NOTED AFTER BACTERIOLOGICAL CLEARANCE IS RECEIVED FROM THE HEALTH DEPARTMENT.

1" BACTERIOLOGICAL SAMPLE POINT DETAIL
N.T.S.

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DRAWN S SIMS
CHECKED D PLAVCAN

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

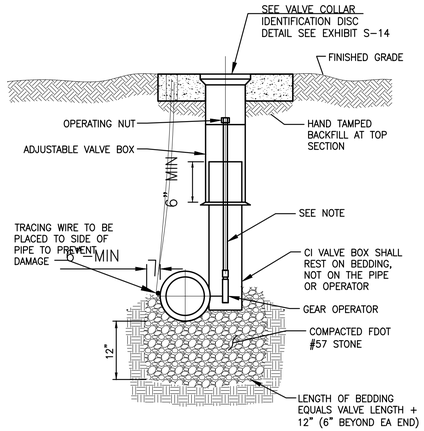
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DWG NO: C25

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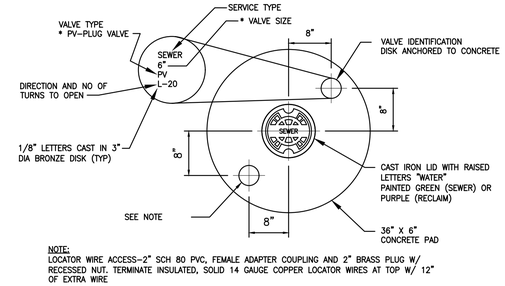
NOTES:
1. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.
2. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.

PLUG VALVE
NTS

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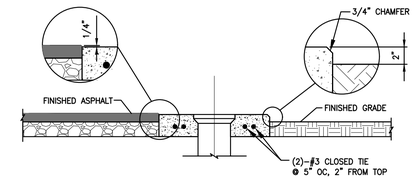
NOVEMBER 2021

S-12



NOTE:
LOCATOR WIRE ACCESS-2" SCH 80 PVC, FEMALE ADAPTER COUPLING AND 2" BRASS PLUG W/ RECESSED NUT. TERMINATE INSULATED, SOLID 14 GAUGE COPPER LOCATOR WIRES AT TOP W/ 12" OF EXTRA WIRE

PLAN VIEW



VALVE COLLAR AND IDENTIFICATION DISK
NTS

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CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
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NOVEMBER 2021

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

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8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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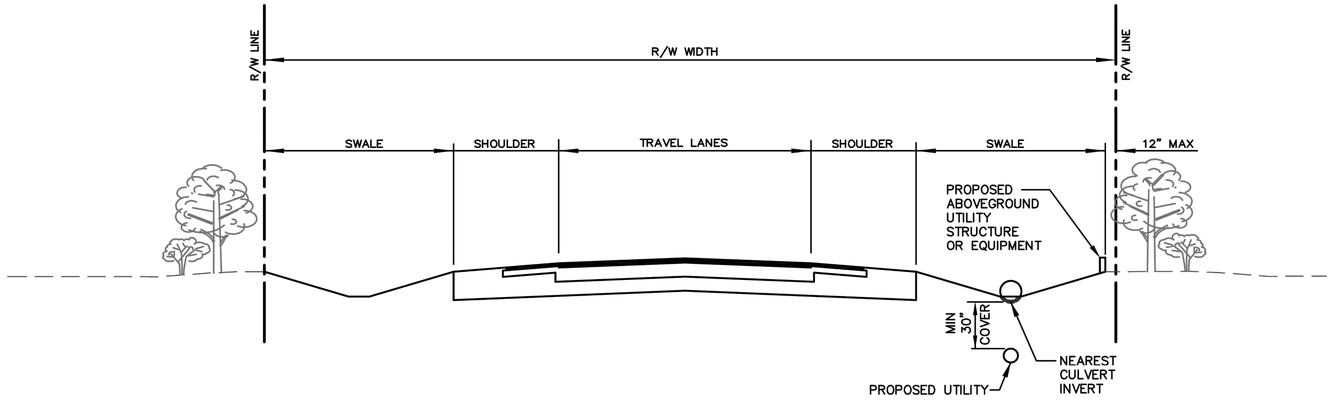
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DATE: NOV. 2023
INDEX NO:
DWG NO: C26

BID DOCUMENTS

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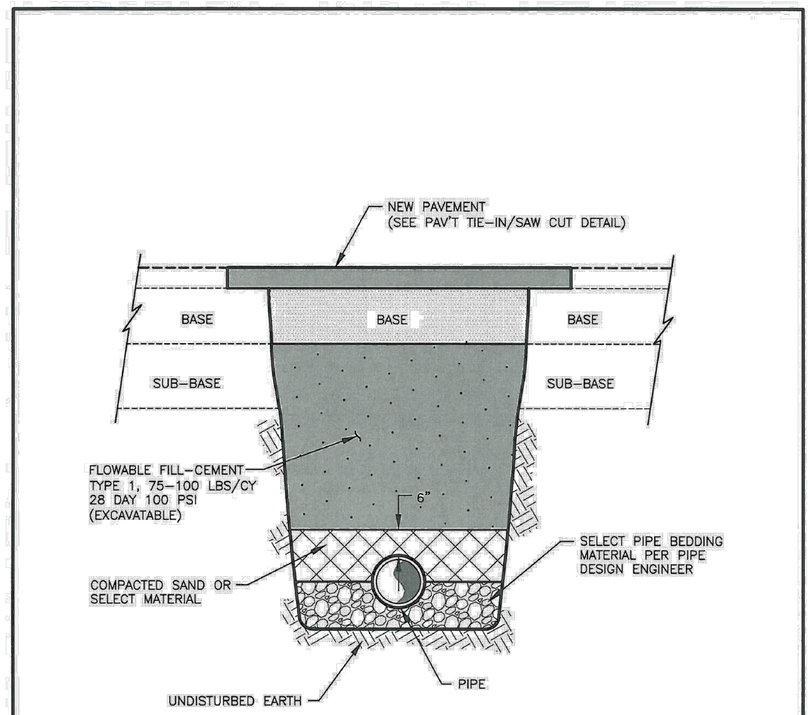
UTILITY INSTALLATION IN SWALE NEAR CULVERT

NTS

NOTE:
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ANY PROPOSED ALTERATIONS SHALL BE CLEARLY IDENTIFIED AND HIGHLIGHTED ON DETAIL.

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PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	UTILITY INSTALLATION DETAIL RURAL ROADWAY TYPICAL SECTION	Sheet No. 1 of 1	
	APPROVED BY JCW BCC APPROVAL REVISED	Index No. 301	



TYPICAL TRENCH SECTION

NTS

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PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	FLOWABLE FILL	Sheet No. 1 of 1	
	APPROVED BY JCW BCC APPROVAL REVISED	Index No. 103	

09/07/08

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
MSS CHECKED D PLAVCAN

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

CIVIL DETAILS

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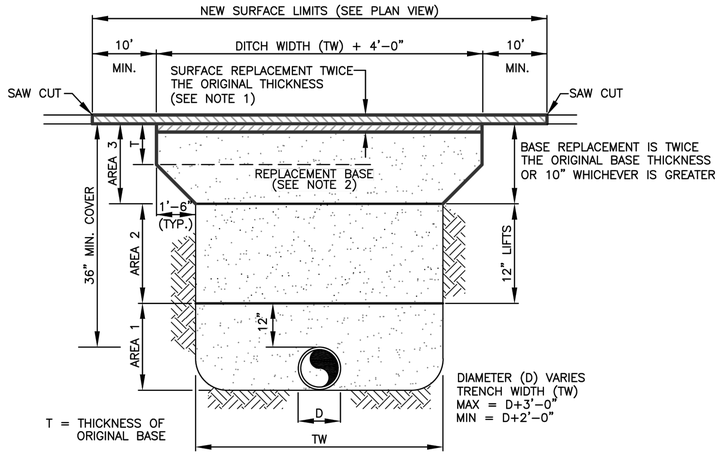
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INDEX NO:	DWG NO: C27

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NOTES

1. REPLACEMENT ASPHALT SHALL BE TWICE THE ORIGINAL PAVEMENT THICKNESS WITH A MINIMUM OF TWO (2) INCHES AND SHALL BE SP 12.5 OR TYPE S-3 ASPHALT, AND FC-3 IF REQUIRED.
2. REPLACEMENT BASE SHALL BE NEW MATERIAL NOT REUSED FROM EXCAVATION. ACCEPTABLE BASE ALTERNATIVE SHALL BE TYPE ABC OR BETTER ASPHALT PLACED AT A TOTAL THICKNESS OF SIX (6) INCHES.
3. AREA 1 – BACKFILL SHALL BE PLACED IN SIX (6) INCH LIFT WITH EACH LIFT COMPACTED TO **98% OF ASTM FM5-521** USING MECHANICAL TAMPERS.
4. AREA 2 – BACKFILL SHALL BE PLACED IN TWELVE (12) INCH LIFTS WITH EACH LIFT COMPACTED TO **98% OF FM5-521** USING APPROPRIATE COMPACTING EQUIPMENT.
5. AREA 3 – LIMEROCK (LBR 100) BASE SHALL BE CONSTRUCTED IN LIFTS NOT GREATER THAN SIX (6) INCHES COMPACTED THICKNESS, AND HAVE A DENSITY EQUAL TO **98% OF FM5-521**.
6. FLOWABLE FILL MAY BE PLACED ABOVE AREA 1 UP TO THE BOTTOM OF THE RESTORED BASE. MIX DESIGN SHALL CONFORM TO FDOT STANDARD SPECIFICATIONS SECTION 121. IF FLOWABLE FILL IS USED FOR TRENCH BACKFILL, THE AMOUNT OF COVER ABOVE TOP OF PIPE TO AREA 2 MAY BE REDUCED TO 6 INCHES.

Tests shall be submitted to Pasco County Engineering Inspections verifying open cut restoration is per general notes before release of permit or gurantee, if applicable. Material and thickness verification shall be required. All testing shall be Pasco County Services Department Testing Specificatiions for Construction of Roads, Storm Drainage and Utilities; October 2006.

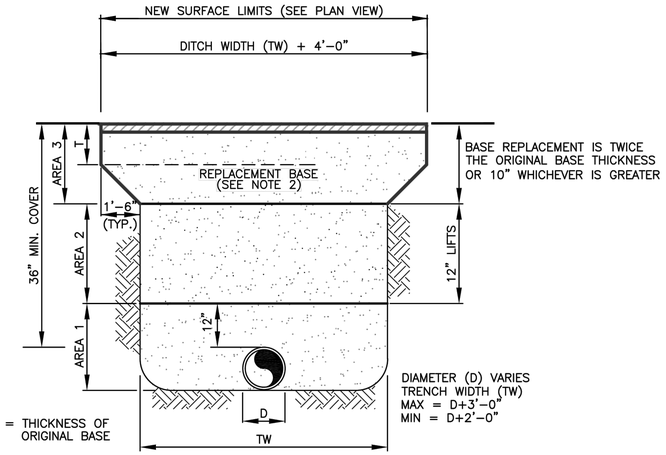
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PASCO COUNTY ENGINEERING SERVICES **DESIGN STANDARDS**	**OPEN CUT RESTORATION**		Sheet No. 1 of 1
	APPROVED BY MICHAEL J. GARRETT, P.E.	BCC APPROVAL REVISED	Index No. 102

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TYPICAL ASPHALT PAVEMENT RESTORATION DETAIL 1

NTS



NOTES

1. REPLACEMENT ASPHALT SHALL BE TWICE THE ORIGINAL PAVEMENT THICKNESS WITH A MINIMUM OF TWO (2) INCHES AND SHALL BE SP 12.5 OR TYPE S-3 ASPHALT, AND FC-3 IF REQUIRED.
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PASCO COUNTY ENGINEERING SERVICES **DESIGN STANDARDS**	**OPEN CUT RESTORATION**		Sheet No. 1 of 1
	APPROVED BY MICHAEL J. GARRETT, P.E.	BCC APPROVAL REVISED	Index No. 102

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TYPICAL LIMEROCK RESTORATION DETAIL 2

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DRAWN S SIMS
CHECKED D PLAVCAN

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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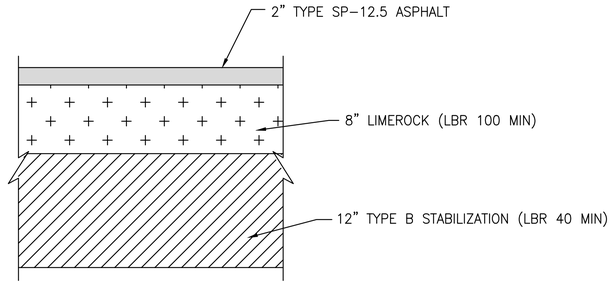
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INDEX NO:	DWG NO: C28

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TYPICAL ASPHALT PAVEMENT DETAIL 1

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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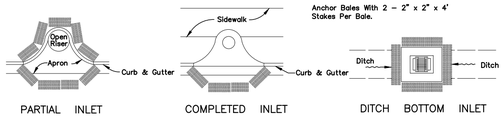
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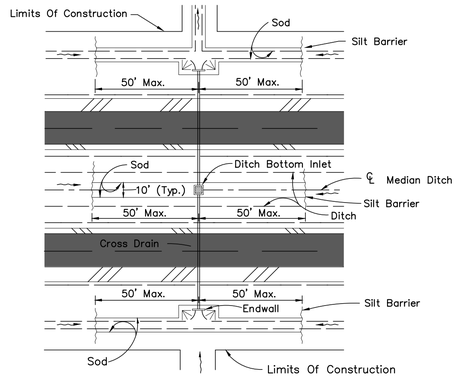
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EROSION AND SEDIMENT CONTROL NOTES

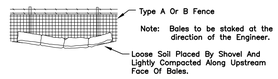
1. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING SILT FROM SITE IF NOT REUSABLE ON-SITE AND ASSURING PLAN ALIGNMENT AND GRADE IN ALL DITCHES AND SWALES AT COMPLETION OF CONSTRUCTION.
2. THE SITE CONTRACTOR IS RESPONSIBLE FOR REMOVING THE TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES AFTER COMPLETION OF CONSTRUCTION AND ONLY WHEN AREAS HAVE BEEN STABILIZED.
3. ADDITIONAL PROTECTION – ON-SITE PROTECTION IN ADDITION TO THE ABOVE MUST BE PROVIDED THAT WILL NOT PERMIT SILT TO LEAVE THE PROJECT CONFINES DUE TO UNSEEN CONDITIONS OR ACCIDENTS.
4. CONTRACTOR SHALL INSURE THAT ALL DRAINAGE STRUCTURES, PIPES, ETC. ARE CLEANED OUT AND WORKING PROPERLY AT TIME OF ACCEPTANCE.
5. WIRE MESH SHALL BE LAID OVER THE DROP INLET SO THAT THE WIRE EXTENDS A MINIMUM OF 1 FOOT BEYOND EACH SIDE OF THE INLET STRUCTURE. HARDWARE CLOTH OR COMPARABLE WIRE MESH WITH 1/2-INCH OPENINGS SHALL BE USED. IF MORE THAN ONE STRIP OF MESH IS NECESSARY, THE STRIPS SHALL BE OVERLAPPED.
6. FDOT NO. 1 COARSE AGGREGATE SHALL BE PLACED OVER THE WIRE MESH AS INDICATED IN D-903. THE DEPTH OF STONE SHALL BE AT LEAST 12 INCHES OVER THE ENTIRE INLET OPENING. THE STONE SHALL EXTEND BEYOND THE INLET OPENING AT LEAST 18 INCHES ON ALL SIDES.
7. IF THE STONE FILTER BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER ADEQUATELY PERFORMS ITS FUNCTION, THE STONES MUST BE PULLED AWAY FROM THE INLET, CLEANED AND REPLACED.
8. BALES SHALL BE EITHER WIRE-BOUND OR STRING-TIED WITH THE BINDINGS ORIENTED AROUND THE SIDES RATHER THAN OVER AND UNDER THE BALES.
9. BALES SHALL BE PLACED LENGTHWISE IN A SINGLE ROW SURROUNDING THE INLET, WITH THE ENDS OF ADJACENT BALES PRESSED TOGETHER.
10. THE FILTER BARRIER SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED TO A MINIMUM DEPTH OF 8 INCHES. AFTER THE BALES ARE STAKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AND COMPACTED AGAINST THE FILTER BARRIER.
11. EACH BALE SHALL BE SECURELY ANCHORED AND HELD IN PLACE BY AT LEAST TWO STAKES OR REBARS DRIVEN THROUGH THE BALE.
12. LOOSE STRAW SHOULD BE WEDGED BETWEEN BALES TO PREVENT WATER FROM ENTERING BETWEEN BALES.
13. STRAW BALE BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
14. CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED BALES, END RUNS AND UNDERCUTTING BENEATH BALES.
15. NECESSARY REPAIRS TO BARRIERS OR REPLACEMENT OF BALES SHALL BE ACCOMPLISHED PROMPTLY.
16. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE STRAW BALE BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.
17. SILT FENCES AND FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
18. SHOULD THE FABRIC ON A SILT FENCE OR FILTER BARRIER DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
19. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-THIRD THE HEIGHT OF THE BARRIER.
20. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.
21. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
22. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
23. THE CONTRACTOR IS RESPONSIBLE FOR FOLLOWING THE BEST EROSION AND SEDIMENT CONTROL PRACTICES AS OUTLINED IN THE PLANS, SPECIFICATIONS AND ST. JOHNS RIVER WATER MANAGEMENT DISTRICT SPECIFICATIONS AND CRITERIA.
24. FOR ADDITIONAL INFORMATION ON SEDIMENT AND EROSION CONTROL REFER TO "THE FLORIDA DEVELOPMENT MANUAL – A GUIDE TO SOUND LAND AND WATER MANAGEMENT" FROM THE STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION (F.D.E.R.) CHAPTER 6.
25. EROSION AND SEDIMENT CONTROL BARRIERS SHALL BE PLACED ADJACENT TO ALL WETLAND AREAS WHERE THERE IS POTENTIAL FOR DOWNSTREAM WATER QUALITY DEGRADATION. SEE DETAIL SHEET FOR TYPICAL CONSTRUCTION.
26. ALL DISTURBED AREAS SHALL BE GRASSED, FERTILIZED, MULCHED AND MAINTAINED UNTIL A PERMANENT VEGETATIVE COVER IS ESTABLISHED.
27. SOD SHALL BE PLACED IN AREAS WHICH MAY REQUIRE IMMEDIATE EROSION PROTECTION TO ENSURE WATER QUALITY STANDARDS ARE MAINTAINED.
28. ANY DISCHARGE FROM DEWATERING ACTIVITY SHALL BE FILTERED AND CONVEYED TO THE OUTFALL IN A MANNER WHICH PREVENTS EROSION AND TRANSPORTATION OF SUSPENDED SOLIDS TO THE RECEIVING OUTFALL.
29. DEWATERING PUMPS SHALL NOT EXCEED THE CAPACITY OF THAT WHICH REQUIRES A CONSUMPTIVE USE PERMIT FROM THE ST. JOHNS RIVER WATER MANAGEMENT DISTRICT.
30. ALL DISTURBED AREAS TO BE STABILIZED THROUGH COMPACTION, SILT SCREENS, HAY BALES, AND GRASSING. ALL FILL SLOPES 3:1 OR STEEPER TO RECEIVE STAKED SOLID SOD.
31. ALL DEWATERING, EROSION, AND SEDIMENT CONTROL TO REMAIN IN PLACE AFTER COMPLETION OF CONSTRUCTION AND REMOVED ONLY WHEN AREAS HAVE STABILIZED.
32. THIS PLAN INDICATES THE MINIMUM EROSION AND SEDIMENT MEASURES REQUIRED FOR THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR MEETING ALL APPLICABLE RULES, REGULATIONS AND WATER QUALITY GUIDELINES AND MAY NEED TO INSTALL ADDITIONAL CONTROLS.
33. THE CONTRACTOR SHALL BE REQUIRED TO RESPOND TO ALL WATER MANAGEMENT DISTRICT INQUIRIES, RELATIVE TO COMPLIANCE OF SJRWMD FOR EROSION AND SEDIMENTATION CONTROL. THE COST OF THIS COMPLIANCE SHALL BE PART OF THE CONTRACT.



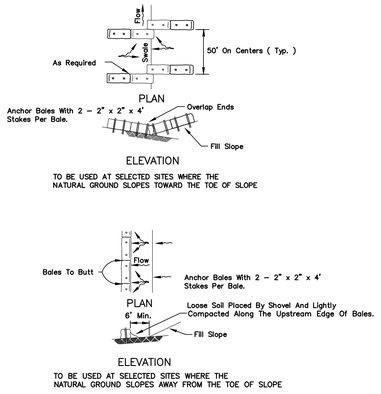
PROTECTION AROUND INLETS OR SIMILAR STRUCTURES



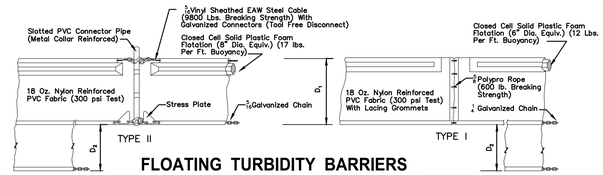
DITCH INSTALLATIONS AT DRAINAGE STRUCTURES



BALES BACKED BY FENCE

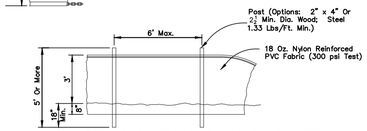


BARRIERS FOR FILL SLOPES

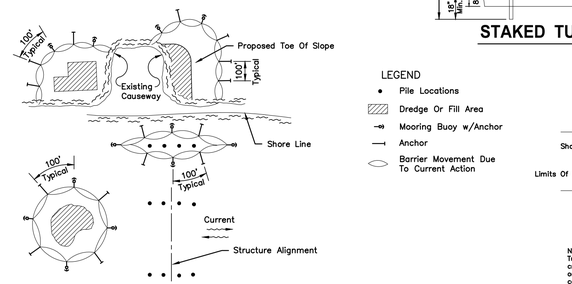


FLOATING TURBIDITY BARRIERS

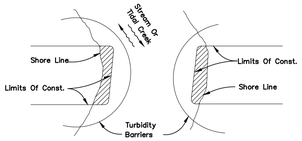
NOTICE:
COMPONENTS OF TYPES I & TYPE II MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES I AND II SHALL BE AS APPROVED BY THE ENGINEER.



STAKED TURBIDITY BARRIER



NOTES:
1. Turbidity barriers are to be used in all permanent bodies of water regardless of water depth.
2. Number and spacing of anchors dependent on current velocities.
3. Deployment of barrier around pile locations may vary to accommodate construction operations.
4. Navigation may require segmenting barrier during construction operations.
5. For additional information see Section 104 of the FDOT Standard Specifications.



Note:
Turbidity barriers for flowing streams and tidal creeks may be either floating, or staked types or any combinations of types that will suit site conditions and meet erosion control and water quality requirements. The barrier type(s) will be at the Contractors option unless otherwise specified in the plans, however payment will be under the contract lump sum price established in the bid proposal for Erosion & Sediment Control Posts in staked turbidity barriers to be installed in vertical position unless otherwise directed by the Engineer.

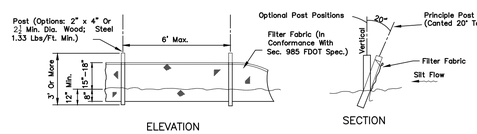
TURBIDITY BARRIER APPLICATIONS

TURBIDITY BARRIERS

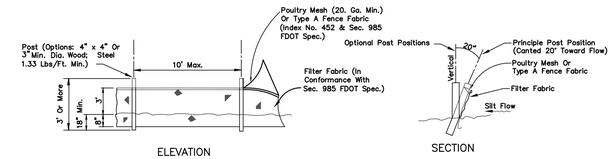
(D-907)
N.T.S.

HAY BALE LOCATION

(D-901)
N.T.S.

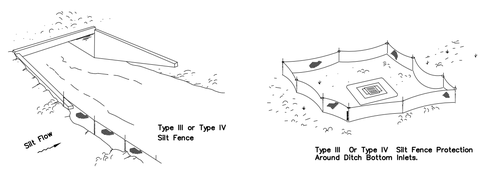


TYPE III SILT FENCE

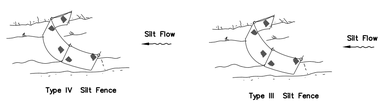


Note: Silt Fence to be paid for under the contract lump sum price for Erosion and Sediment Control.

TYPE IV SILT FENCE



Do not deploy in a manner that silt fences will act as a dam across permanent flowing watercourses. Silt fences are to be used at upland locations and turbidity barriers used at permanent bodies of water.

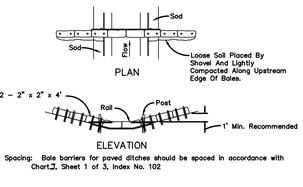


Note: Spacing for Type III & TYPE IV Fence to be in accordance with Chart 1, Sheet 1 of 3, FDOT Index No. 102 and ditch installations at drainage structures Sheet 2 of 3, FDOT Index No. 102.

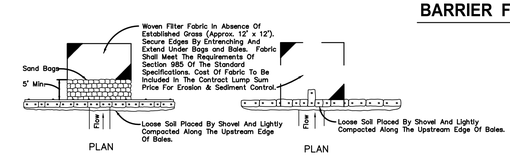
SILT FENCE APPLICATIONS

SILT FENCE TYPE III & IV

(D-908)
N.T.S.



BARRIER FOR PAVED DITCH



Application and Spacing: The use of Types I & II bale barriers should be limited to the conditions outlined in Chart 1, Sheet 1 of 3, Index No. 102

TYPE II TYPE I

BARRIER FOR UNPAVED DITCHES

NOTE:
WHERE FDOT SPECS AND INDEX ARE REFERENCED, PLEASE REFER TO FDOT ROADWAY & TRAFFIC DESIGN STANDARDS, AND FDOT STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION.

HAY BALE BARRIERS TYPE I & II

(D-912)
N.T.S.

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

STORMWATER POLLUTION PREVENTION DETAILS

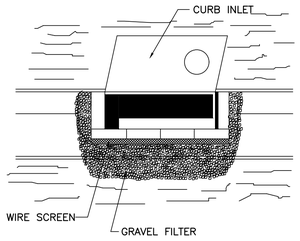
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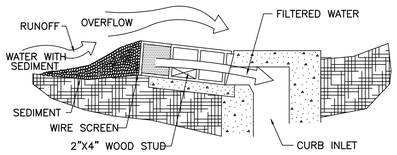
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PROJECT NO: 26110-051-01
DATE: NOV. 2023
INDEX NO:
DWG NO: EC1

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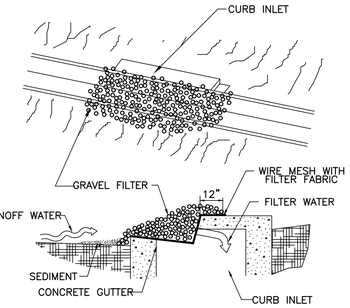


SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE AN OVERFLOW CAPABILITY IS NECESSARY TO PREVENT EXCESSIVE PONDING IN FRONT OF THE STRUCTURE.

BLOCK & GRAVEL CURB INLET SEDIMENT FILTER

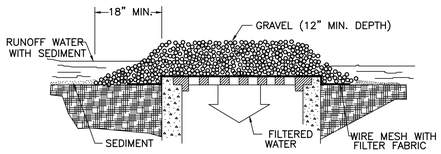
(D–902)
N.T.S.



GRAVEL CURB INLET SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE PONDING IN FRONT OF THE STRUCTURE IS NOT LIKELY TO CAUSE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.



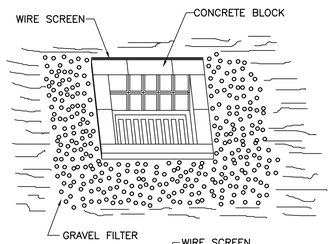
GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER

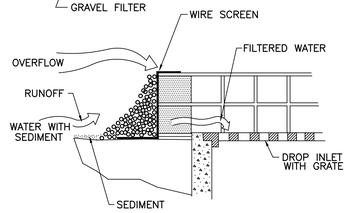
SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY CONCEN– TRATED FLOWS ARE EXPECTED, BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

GRAVEL INLET SEDIMENT TRAP

(D–903)
N.T.S.



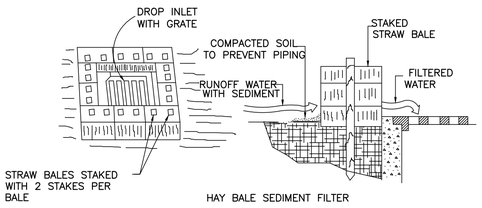


SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.

BLOCK & GRAVEL DROP INLET SEDIMENT FILTER

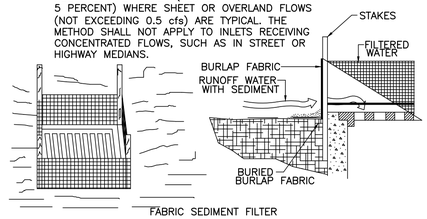
(D–904)
N.T.S.



HAY BALE SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 cfs) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.



FABRIC SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 cfs) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS. SUCH AS IN STREET OR HIGHWAY MEDIANS.

DROP INLET SEDIMENT TRAP

(D–905)

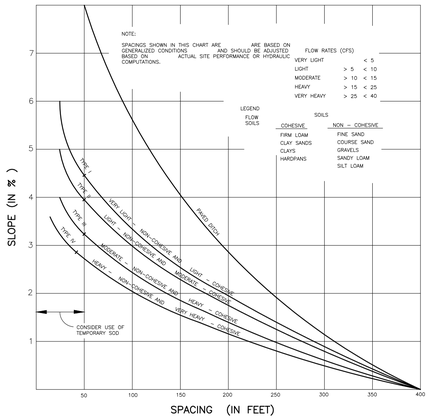
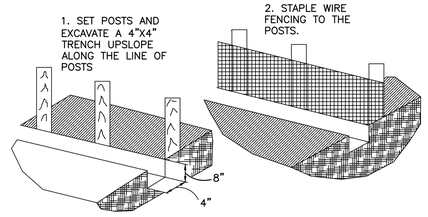


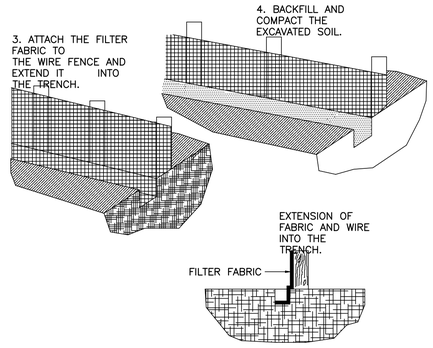
CHART I

RECOMMENDED SPACING FOR TYPE I AND TYPE II HAY BALE BARRIERS, AND TYPE III AND TYPE IV SILT FENCES AND PAVED DITCH HAY BALE BARRIERS

SPACING RECOMMENDATION FOR SILT FENCES & HAY BALES

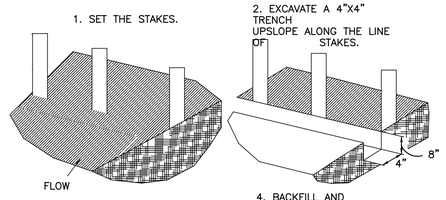
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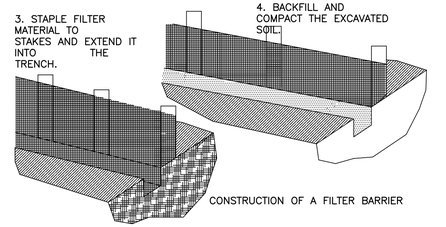




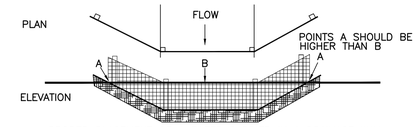
CONSTRUCTION DETAILS FOR SILT FENCES

(D–909)
N.T.S.





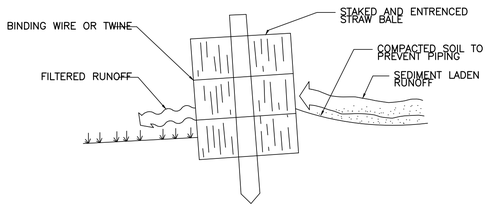
CONSTRUCTION OF A FILTER BARRIER



PROPER PLACEMENT OF A FILTER BARRIER IN A DRAINAGE WAY

FILTER BARRIER CONSTRUCTION DETAIL

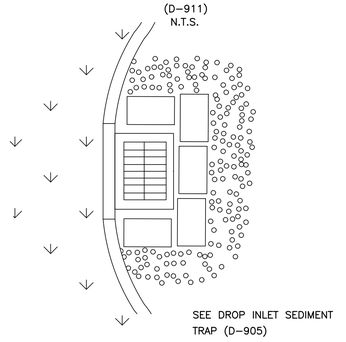
(D–910)
N.T.S.



CROSS–SECTION OF A PROPERLY INSTALLED STRAW BALE

STAKED HAY BALE

(D–911)
N.T.S.



ERECT SEDIMENT BARRIERS AT CATCH BASINS

(TYPICAL)

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

STORMWATER POLLUTION PREVENTION DETAILS

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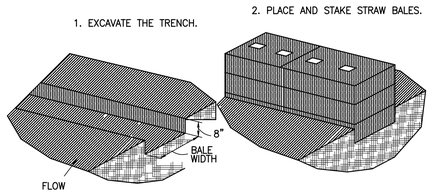
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DATE: NOV. 2023
INDEX NO:
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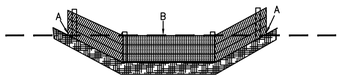
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CONSTRUCTION OF A HAY BALE BARRIER

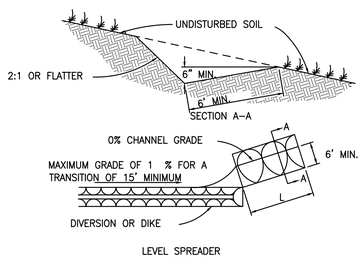


POINTS A SHOULD BE HIGHER THAN POINT B

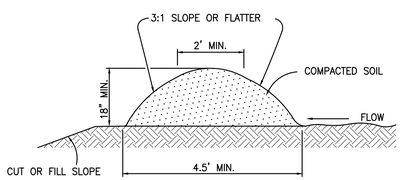
PROPER PLACEMENT OF HAY BALE BARRIER IN DRAINAGE WAY

HAY BALE BARRIER CONSTRUCTION DETAILS

(D-913)
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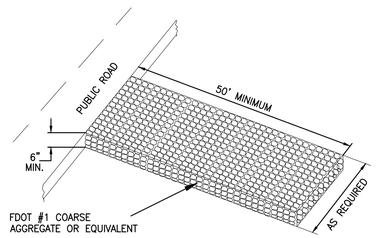
LEVEL SPREADER



TEMPORARY DIVERSION DIKE

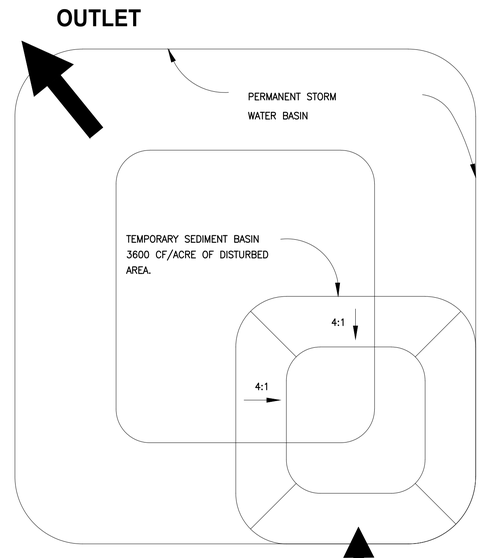
DIVERSION DIKE

(D-914)
N.T.S.



STABILIZED CONSTRUCTION ENTRANCE

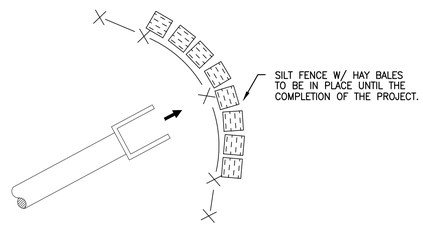
N.T.S.



NOTE: THIS REPRESENT THE OPTIMUM LOCATION OF THE TEMPORARY SEDIMENT BASIN. OTHER ON-SITE LOCATIONS MAY ALSO BE APPROPRIATE.

TEMPORARY SEDIMENT BASIN

N.T.S.



OUTLET PROTECTION

N.T.S.

BID DOCUMENTS

SAVED: 8/11/2023 4:04 PM SSIMS Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\051-01 SOUTH 301 W-WW PIPELINES\DESIGN&CONSTRUCTION\CAD\DWGS\ENV\26110051101-EC04.DWG

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

STORMWATER POLLUTION PREVENTION DETAILS

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH A. FRASER, PE #57452 ON THE DATE SHOWN ON THE COVER SHEET.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

PROJECT NO: 26110-051-01
DATE: NOV. 2023
INDEX NO:
DWG NO: EC3

US Water Services Corporation Proposal

Pricing unsealed at Jan 12, 2024 1:00 PM

CONTACT INFORMATION

Company
US Water Services Corporation

Email
ccrego@uswatercorp.net

Contact
Christina Crego

Address
4939 CROSS BAYOU BOULEVARD
New Port Richey FL 34652
NEW PORT RICHEY, FL 34652

Phone
(727) 848-8292 Ext: 222

Website
www.uswatercorp.com

Submission Date
Jan 12, 2024 12:29 PM

ADDENDA CONFIRMATION

Addendum #1
Confirmed Dec 29, 2023 3:08 PM by Christina Crego

Addendum #2
Confirmed Dec 29, 2023 3:08 PM by Christina Crego

Addendum #3
Confirmed Dec 29, 2023 3:08 PM by Christina Crego

Addendum #4
Confirmed Dec 29, 2023 3:08 PM by Christina Crego

Addendum #5
Confirmed Jan 9, 2024 10:41 AM by Christina Crego

QUESTIONNAIRE

1. Respondent Submittals (without Cost)* ☐ Pass ☐ Fail

Please Upload your COMPLETE response, including any and all required forms listed in the solicitation and the corresponding attachments.

(Do not upload cost information in here)

USW_W-9_Signed.pdf

CGC003307_Cecil_Delcher_08.2024.pdf

CUC1223914_G.Deremer_08.2024.pdf

Detail_by_Entity_Name_01.2024.pdf

3.1._ITB_Cover_Page-Signed_Notarized_(signed).pdf

3.4._Page_22-Package_Signed_(signed).pdf

3.5._Bid_Bond_(signed).pdf

3.6._Public_Entity_Crimes-Signed_Notarized_(signed).pdf

3.7._E-verify_Certification_(signed).pdf

3.8._Addenda_Acknowledgement_(signed).pdf

3.9._Drug_Free_Workplace_Form_(signed).pdf

3.10._Non-Collusive_Affidavit_(signed).pdf

3.11._Errors_or_Omissions_(signed).pdf

3.12._References-Similar_Projects_(Completed).pdf

3.13._References-Active_Projects_(completed).pdf

3.14._Certification_of_Debarment_Suspension_(signed).pdf

3.15._Trench_Safety_Form_(signed).pdf

3.2._Bid_Form_-_Part_1_(signed).pdf

3.3._Bid_Form_Part_2-Detailed_A3.pdf

2. I certify that I have read, understood and agree to the terms in this solicitation, and that I am authorized to submit this response on behalf of my company.*

☑ Confirmed ☐ Pass ☐ Fail

3. Response Checklist

By selecting confirm, you are certifying that you have submitted the corresponding attachments and documents as part of your submittal in the question "Respondent Submittals (without cost)"

3.1. ITB Cover Page-Signed/Notarized Included In Response ☐ Pass ☐ Fail

☑ Confirmed

3.2. Bid Form - Part 1 Included in your Response ☐ Pass ☐ Fail

☑ Confirmed

3.3. Bid Form Part 2-Detailed Included in your Response ☐ Pass ☐ Fail

☑ Confirmed

3.4. Page 22-Package Signed and Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.5. Bid Bond - Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.6. Public Entity Crimes-Signed/Notarized Incl in response ☐ Pass ☐ Fail

☑ Confirmed

3.7. E-verify Certification-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.8. Addenda Acknowledgement-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.9. Drug Free Workplace Form - Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.10. Non-Collusive Affidavit-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.11. Errors or Omissions-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.12. References-Similar Projects-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.13. References-Active Projects included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.14. Certification of Debarment/Suspension - Included in response ☐ Pass ☐ Fail

☑ Confirmed

3.15. Trench Safety Form-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

PRICE TABLES

South 301 W Water and Wastewater Pipelines

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions	1	LS	$41,257.00	$41,257.00
2	Traffic Control	1	LS	$30,000.00	$30,000.00
3	Environmental Protection	1	LS	$150,000.00	$150,000.00
4	Construction Survey and Layout	1	LS	$12,877.00	$12,877.00
5	6-Inch Sanitary Sewer Force Main via Open-Cut	1300	LF	$109.65	$142,545.00
6	6-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	4400	LF	$44.92	$197,648.00
7	8-Inch Potable Water Main via Open-Cut	600	LF	$164.18	$98,508.00

8	8-Inch Potable Water Main via HDD	1900	LF	$62.72	$119,168.00
9	Combination Air/Vacuum Valves and Vaults	10	EA	$5,000.00	$50,000.00
10	Concrete Restoration	50	SY	$150.00	$7,500.00
11	Limerock Restoration	355	SY	$35.00	$12,425.00
12	Asphalt Concrete Restoration	278	SY	$25.00	$6,950.00
13	Testing Allowance	1	AL	$25,000.00	$25,000.00
14	Record Drawings Allowance	1	AL	$15,000.00	$15,000.00
	Total				**$908,878.00**

Contingency

10% of Total Bid Form

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	Contingency - 10%	1	EA	$90,887.80	$90,887.80
	Total				**$90,887.80**

AGENCY:		INVITATION TO BID
CITY OF ZEPHYRHILLS ATTN: PURCHASING DEPT 5335 8TH STREET ZEPHYRHILLS, FL 33542	Zephyrhills jump right in	Response Acknowledgement

PURCHASING AGENT: Karen Miller	AN EQUAL OPPORTUNITY EMPLOYER	
Phone: 813-780-0000 x3536	FLORIDA TAX EXEMPT	#85-8012740166C-4
Email: kmiller@ci.zephyrhills.fl.us	FEDERAL IDENTIFICATION NUMBER	#59-6000455

Obtained ALL Bid Documents and Submit Q&A and Responses electronically on: OPENGOV - LINK ON WEBSITE WWW.CI.ZEPHYRHILLS.FL.US

BID/PROPOSAL NUMBER	DISTRIBUTION DATE	BID/PROPOSAL TITLE	BID/PROPOSAL RESPONSES OPENING DATE/TIME
ITB 2023-03	11/20/2023	South 301 W Water & Wastewater Pipeline	OpenGov Online- Friday, January 12, 2024 before 1 PM

TELE CONFERENCE DATE GoTo Meetng ☒ Strongly Recommended ☐ None	RESPONSES RECEIVED AFTER ABOVE
DATE: 12-4-2023 TIME: 10:00 AM 2nd Floor Conference Room	DATE AND TIME
GoTo LINK: https://meet.goto.com/159259221 Or, City Hall-2nd Flr Conf Rm	WILL NOT BE ACCEPTED
Call: 1-335-602-4523 ACCESS CODE: 269-369-332	Bid Bonds must be received

SITE VISIT: After the Meeting

VENDOR MUST COMPLETE THE BELOW AREAS AND RETURN FORM, NOTARIZED. FORM IS REQUIRED.

RESPONDER'S NAME/ADDRESS:
U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652

TELPHONE NUMBER: 727 848 8292

EMAIL ADDRESS: CCREGO@USWATERCORP.NET

If returning as a "NO" state reason:

I certify this Response is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a Response for the same materials, supplies or equipment, and is in all respects fair and without collusion or fraud. I agree to all conditions of this Bid/Proposal and certify that I am authorized to sign this Response for the company. In submitting a Response to the City of Zephyrhills the Responder offers and agrees that if this Response is accepted, the Company will convey, sell, assign or transfer to the City of Zephyrhills all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the Anti-trust laws of the United States and the State of Florida for price fixing relating to the particular commodities or services purchased or acquired by the City of Zephyrhills. At the City's discretion, such assignment shall be made and become effective at the time the City tenders final payment to the Company.

FEDERAL EMPLOYER ID NUMBER OR SS NUMBER:
20-0008821

X

AUTHORIZED SIGNATURE

Gary Deremer, President

PRINTED NAME/TITLE

THIS FORM MUST BE NOTARIZED BELOW

Sworn to and subscribed to me this 12th day of January, 2024

Personally known: ☒ Or produced identification: ☐

Type of ID: _____

Notary Signature

Florida
State

My commission expires: January 26, 2025

AFFIX NOTARY STAMP BELOW

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

BONDS

An EBond shall be included in your uploaded response or a certified check delivered to City Hall before the deadline for an amount not less than five (5%) of the total bid price and shall be made payable to the City as a guarantee that the Bidder will not withdraw his bid for a period of forty-five (45) days after bid closing time. Bid, Payment and Performance Bond and all Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

THE CITY OF ZEPHYRHILLS RESERVES THE RIGHT TO REJECT ANY OR ALL PROPOSALS, TO WAIVE INFORMALITIES, AND TO ACCEPT ALL OR ANY PART OF ANY RESPONSE/PROPOSAL AS MAY BE DEEMED TO BE IN THE BEST INTEREST OF THE CITY UNLESS OTHERWISE NOTED, PAYMENT OF GOODS OR SERVICES PROVIDED AS A RESULT OF THIS SOLICITATION WILL BE MADE PER FLORIDA STATUTE. ALL VENDORS MUST SUBMIT A COMPLETED W-9 FORM.

BID RESPONSE FORM
Detailed Bid Form to be Submitted on Page 6, Technical Specifications

In accordance with the Specifications contained herein, I certify that any and all information contained in this bid response is true; and I further certify that this bid is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a bid for the same materials, supplies, equipment, or services and is in all respects fair and without collusion or fraud. I agree to abide by all terms and conditions of the bid, and certify that I am authorized to sign for the applicant firm. *Please print the following and sign your name.*

Amount of Base Bid	$ 908,878.00
10% Contingency *Contingency is not guaranteed.*	$ 90,887.80
Total Contract Sum (Amount of Bid + Contingency)	$ 999,765.80

Any contingency items shall be communicated by written change order and shall be approved by both the Owner and Contractor.

Total Contract Sum of Bid in Words: NINE HUNDRED NINETY-NINE THOUSAND SEVEN HUNDRED SIXTY-FIVE AND EIGHT TENTHS

The **BIDDER** must submit a bid on all items contained in specification or the bid shall be considered irregular. The **OWNER** reserves the right to accept or reject the bid. The **OWNER**, or his representative, further reserves the unqualified right to determine whether any particular item or items or materials, equipment, or whatsoever is an approved equal, and reserves the unqualified right to a final decision regarding the approval or rejection of the same. The bid selection shall be based on the apparent low bidder for the **"TOTAL CONTRACT SUM"**.

Add'l Documents Included:

- [X] Bid Form
- [X] Bid Bond/Check
- [X] References
- [X] Public Entity Crimes
- [X] License(s) copies
- [X] Drug Free Workplace
- [ ] No-Bid
- [X] Page 22, Signature/Seal
- [X] Addenda Affidavit
- [X] E-Verify
- [X] Non Collusive
- [X] Certification re: Debarment, Suspension, Ineligibility & Voluntary Exclusion

NAME, ADDRESS, AND SIGNATURE OF BIDDER:

NAME: Gary Deremer **TITLE:** President

ADDRESS: 4939 Cross Bayou Blvd., New Port Richey FL 34652

PHONE: 727 848 8292 **FAX:** 727 842 6412

E-MAIL ADDRESS: CCREGO@USWATERCORP.NET

BIDDER SIGNATURE: **DATE:** January 12, 2024

Corporate Seal or Notarization below date

US Water Services Corporation CORPORATE SEAL 2003 FLORIDA

BID REQUIREMENTS

CITY OF ZEPHYRHILLS
South 301 W Water and Wastewater Pipelines
CONSTRUCTION ITEMIZED PRICING SHEET

Item No.	Item Description	Qty.	Unit	Unit Price	Amount
BASE BID					
1	Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions (5% of Base Bid)	1	LS	$41,257.00	$41,257.00
2	Traffic Control	1	LS	$30,000.00	$30,000.00
3	Environmental Protection	1	LS	$150,000.00	$150,000.00
4	Construction Survey and Layout (1.5% of Base Bid)	1	LS	$12,877.00	$12,877.00
5	6-Inch Sanitary Sewer Force Main via Open-Cut	1,300	LF	$109.65	$142,545.00
6	6-inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	4,400	LF	$44.92	$197,648.00
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8	8-inch Potable Water Main via HDD	1,900	LF	$62.72	$119,168.00
9	Combination Air/Vacuum Valves and Vaults	10	EA	$5,000.00	50,000.00
10	Concrete Restoration	50	SY	$150.00	$7,500.00
11	Limerock Restoration	355	SY	$35.00	$12,425.00
12	Asphalt Concrete Restoration	278	SY	$25.00	$6,950.00
13	Testing Allowance	1	AL	$	$25,000.00
14	Record/As-Built Drawings Allowance	1	AL	$	$15,000.00
	TOTAL BID PRICE	908,878.00			

Photographs of the Project. *If required by the Owner, the Contractor/Vendor shall furnish photographs of the project, in the quantities* as requested.

Tests and Inspections: All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Owner. The offer or payment of any compensation, whatever may be its character or form, the offer or giving of any gratuity, or the offer or granting of any valuable favor by the Contractor/Vendor to any Inspection, directly or indirectly, is strictly prohibited, and any such act on the part of the Contractor/Vendor will constitute a violation of this Contract.

If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any work to specifically be inspected, tested, or approved by someone other than the Contractor/Vendor, the Contractor/Vendor shall give the City notice of readiness therefore. The Contractor/Vendor shall furnish the City the required certificates of inspection, testing or approval. All such tests shall be in accordance with the methods prescribed by the American Society for Testing and Materials or such other applicable organization as may be required by law or the Contract Documents. If any such work required so to be inspected, tested or approved is covered without approval of the City, it shall be requested by the City, be uncovered for observation at the Contractor's or Vendor's expense. The cost of such inspections, tests, and approvals shall be borne by the Contractor/Vendor unless otherwise provided.

The City of Zephyrhills shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

Use and Occupancy Prior to Acceptance by City: The Contractor/Vendor agrees to the use and occupancy of a portion or unit of the project before formal acceptance by the City, provided the City:

A. Secures written consent of the Contractor/Vendor except in the event, in the opinion of the Architect/Engineer, the Contractor/Vendor is chargeable with unwarranted delay in final cleanup or punch list items or other contract requirements.
B. Secures endorsement from the insurance-carrier and consent of the Surety permitting occupancy of the building or use of the project during the remaining period of construction.

Acceptance: Upon completion, the project manager shall inspect the project to assure all quality control standards are in compliance with the plans and specifications contained herein. The contract retainage ten (10%) will be released for final payment upon completion of all punch list items.

Guarantee and Warranties: Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the City, shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor/Vendor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The

Contractor/Vendor shall remedy any defect in the work and pay for any damage to other work resulting there from, which shall appear within a period of one (1) year from the date of final acceptance of the work unless a longer period is specified. The City will give notice of observed defects with reasonable promptness.

All guarantees and warranties shall commence on the date of substantial completion or on acceptance by the owner of re-work items. The Contractor shall furnish a one (1) year unconditional warranty. The

warranty shall include all manufacturers' warranties on equipment and material installed by the Contractor or any subcontractors. These items shall be transferred to the City and in the City's name. All warranty items shall be secured in an organized 3-ring binder.

City May Stop the Work: If the work is defective, or the Contractor/Vendor fails to supply sufficient skilled workmen or suitable materials or equipment or if the Contractor/Vendor fails to make prompt payments to Subcontractors for labor, materials, or equipment, the City may order the Contractor/Vendor to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the City to stop the work shall not give rise to any duty on the part of the City to exercise this right for the benefit of the Contractor/Vendor or any other party.

For each consecutive calendar day that the work remains incomplete after the date established for final completion, the Contractor/Vendor shall pay City and the City is authorized to retain from the compensation otherwise to be paid to the Contractor/Vendor the sum of the phase schedule, **$1000.00**. This amount is the minimum measure of damages the City will sustain by failure of the Contractor to complete all remedial work, correct deficient work, clean up the project and other miscellaneous tasks as required to complete all work specified. This amount is in addition to the liquidated damages prescribed above, and likewise shall not be construed as a penalty.

The Bidder hereby agrees that the City reserves the right to waive any bid and to reject any or all bids, or to accept any bid that in its judgment will be in the best interest of the City. The bidder's signature understands and acknowledges the requirements set forth in this bid package.

Signature/Print Name/Company
Gary Dermer, U.S. Water Services Corporation

January 12, 2024
Date

In witness whereof, the Bidder has hereunto set his signature and affixed his seal this 12th day of January A.D. 2024

(Seal)

By: Gary Dermer

Title: President

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

THE AMERICAN INSTITUTE OF ARCHITECTS

Executed in 1 Counterpart(s)

AIA Document A310

Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we

U. S. Water Services Corporation
4939 Cross Bayou Blvd.
New Port Richey, FL 34652

(Here insert full name and address or legal title of Contractor/Vendor)

as Principal, hereinafter called the Principal, and

Swiss Re Corporate Solutions America Insurance Corporation
1200 Main Street, Suite 800, Kansas City, MO 64105

(Here insert full name and address or legal title of Surety)

a corporation duly organized under the laws of the State of Missouri

as Surety, hereinafter called the Surety, are held and firmly bound unto

Zephyrhills FL
5335 8th Street, Zephyrhills, FL 33542

(Here insert full name and address or legal title of Owner)

Bonds and All Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

as Obligee, hereinafter called the Obligee, in the sum of Five Percent of Bid Amount ---------- **Dollars ($** 5% of Bid

for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, The Principal has submitted a bid for

ITB-2023-03 South 301 W Water/Wastewater Pipeline

(Here insert full name, address and description of project)

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and Sealed this 12th ***of*** January ***2024***

U. S. Water Services Corporation

(Principal and Title) Gary Doremus President ***(Seal)***

(Witness)

(Attorney-in-Fact & Licensed Resident Agent) April L. Lively
Swiss Re Corporate Solutions America Insurance Corporation
Guignard Company/Inquiries (407) 834-0022

(Surety Seal)

SWORN STATEMENT PURSUANT TO SECTION 287.133(3)(a),

SWISS RE CORPORATE SOLUTIONS

SWISS RE CORPORATE SOLUTIONS AMERICA INSURANCE CORPORATION ("SRCSAIC")
SWISS RE CORPORATE SOLUTIONS PREMIER INSURANCE CORPORATION ("SRCSPIC")
WESTPORT INSURANCE CORPORATION ("WIC")

GENERAL POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, THAT SRCSAIC, a corporation duly organized and existing under laws of the State of Missouri, and having its principal office in the City of Kansas City, Missouri, and SRCSPIC, a corporation organized and existing under the laws of the State of Missouri and having its principal office in the City of Kansas City, Missouri, and WIC, organized under the laws of the State of Missouri, and having its principal office in the City of Kansas City, Missouri, each does hereby make, constitute and appoint:

J.W. GUIGNARD, BRYCE R. GUIGNARD, PAUL J. CIAMBRIELLO, APRIL L. LIVELY, JENNIFER L. HINDLEY, MARGIE L. MORRIS,

DEBORAH ANN MURRAY, M. GARY FRANCIS, CHRISTINE MORTON, KELLY PHELAN, and ALLYSON FOSS WING

JOINTLY OR SEVERALLY

Its true and lawful Attorney(s)-in-Fact, to make, execute, seal and deliver, for and on its behalf and as its act and deed, bonds or other writings obligatory in the nature of a bond on behalf of each of said Companies, as surety, on contracts of suretyship as are or may be required or permitted by law, regulation, contract or otherwise, provided that no bond or undertaking or contract or suretyship executed under this authority shall exceed the amount of:

TWO HUNDRED MILLION ($200,000,000.00) DOLLARS

This Power of Attorney is granted and is signed by facsimile under and by the authority of the following Resolutions adopted by the Boards of Directors of both SRCSAIC and SRCSPIC at meetings duly called and held on the 18th of November 2021 and WIC by written consent of its Executive Committee dated July 18, 2011.

"RESOLVED, that any two of the President, any Managing Director, any Senior Vice President, any Vice President, the Secretary or any Assistant Secretary be, and each or any of them hereby is, authorized to execute a Power of Attorney qualifying the attorney named in the given Power of Attorney to execute on behalf of the Corporation bonds, undertakings and all contracts of surety, and that each or any of them hereby is authorized to attest to the execution of any such Power of Attorney and to attach therein the seal of the Corporation; and it is

FURTHER RESOLVED, that the signature of such officers and the seal of the Corporation may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be binding upon the Corporation when so affixed and in the future with regard to any bond, undertaking or contract of surety to which it is attached."

SWISS RE CORPORATE SOLUTIONS AMERICA INSURANCE CORPORATION CORPORATE SEAL 1973 MISSOURI

SWISS RE CORPORATE SOLUTIONS PREMIER INSURANCE CORPORATION CORPORATE SEAL MISSOURI

By_____
Erik Janssens, Senior Vice President of SRCSAIC & Senior Vice President of SRCSPIC & Senior Vice President of WIC

By_____
Gerald Jagrowski, Vice President of SRCSAIC & Vice President of SRCSPIC & Vice President of WIC

WESTPORT INSURANCE CORPORATION CORPORATE SEAL MISSOURI

IN WITNESS WHEREOF, SRCSAIC, SRCSPIC, and WIC have caused their official seals to be hereunto affixed, and these presents to be signed by their authorized officers

this 10 day of NOVEMBER, 20 22

State of Illinois
County of Cook SS

Swiss Re Corporate Solutions America Insurance Corporation
Swiss Re Corporate Solutions Premier Insurance Corporation
Westport Insurance Corporation

On this 10 day of NOVEMBER, 20 22, before me, a Notary Public personally appeared Erik Janssens, Senior Vice President of SRCSAIC and Senior Vice President of SRCSPIC and Senior Vice President of WIC and Gerald Jagrowski, Vice President of SRCSAIC and Vice President of SPCSPIC and Vice President of WIC, personally known to me, who being by me duly sworn, acknowledged that they signed the above Power of Attorney as officers of and acknowledged said instrument to be the voluntary act and deed of their respective companies.

OFFICIAL SEAL
CHRISTINA MANISCO
NOTARY PUBLIC, STATE OF ILLINOIS
My Commission Expires March 29, 2026

Christina Manisco, Notary

I, Jeffrey Goldberg, the duly elected Senior Vice President and Assistant Secretary of SRCSAIC and SRCSPIC and WIC, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney given by said SRCSAIC and SRCSPIC and WIC, which is still in full force and effect.
IN WITNESS WHEREOF, I have set my hand and affixed the seals of the Companies this 12th day of January, 20 24.

Jeffrey Goldberg, Senior Vice President &
Assistant Secretary of SRCSAIC and
SRCSPIC and WIC

FLORIDA STATUTES ON PUBLIC ENTITY CRIMES- ITB-2023-03

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.

A. This sworn statement is submitted to City of Zephyrhills
(print name of the public entity)

by Gary Deremer, President
(print individual's name and title)

for U.S. Water Services Corporation
(print name of entity submitting sworn statement)

whose business address is

4939 Cross Bayou Blvd., New Port Richey FL 34652

and (if applicable) its Federal Employer Identification Number (FEIN) is 20-008821
(If the entity has no FEIN, include the Social ro Number of the individual signing this sworn statement: .)

B. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

C. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

D. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes means:

a. A predecessor or successor of a person convicted of a public entity crime; or
b. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

E. I understand that a "person" as defined in Paragraph 287.133(1)(e), Florida Statutes means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or

applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

F. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Indicate which statement applies.)

X Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (attach a copy of the final order)

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

_____
(Signature) Gary Deremer, President
State of Incorporation: Florida
U.S. Water Services Corporation
4939 Cross Bayou Blvd., New Port Richey FL 34652

Sworn to and subscribed before me this 12th day of January, 2024. Personally or known

Or Produced identification _____ Notary Public – State of Florida

_____
My commission expires January 26, 2025 (Type of Identification) _____
(Printed, Typed or stamped commissioned name of notary public)

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

E-VERIFY CERTIFICATION FORM- ITB 2023-03

All vendors, contractors and subcontractors doing business with the City of Zephyrhills must certify that they have implemented the federal E-Verify program.

E-Verify is a federal system established by the Department of Homeland Security to determine the immigration and work-eligibility status of prospective employees. Detailed E-Verify program information for employers can be found at http://www.dhs.gov/e-verify.

Prior to providing goods or services to the City of Zephyrhills, vendors must certify compliance with the federal E-Verify program. In the case of contractors, this includes obtaining written certification from all subcontractors who will participate in the performance of the contract. The certification below has been prepared for all vendors and contractors to use for this purpose. All subcontractor certifications must be kept on file with the contract vendor and made available to the state and/or City upon request.

CERTIFICATION

(In accordance with Executive Order No. 11-02)

I certify that the company shown below is in compliance with the above statement and that I am authorized to sign on its behalf.

Name of Company: U.S. Water Services Corporation

Authorized Signature: _____

Printed Name/Title: Gary Dermer, President

Address: 4939 Cross Bayou Blvd., New Port Richey FL 34652

Date: January 12, 2024

Phone: 727 848 8292

Email: CCREGO@USWATERCORP.NET

The City of Zephyrhills reserves the right to determine how it will respond to any instances of non-compliance or false certification of compliance. Potential City actions include, but are not limited to, cancellation of the contract and/or suspending or debarring the contract vendor from performing services in any aspect to the City.

Please send the completed form with your submittal.

Addenda Receipt Acknowledgment- ITB 2023-03

Addendum #	1	Date	12/4/23	Initials	
Addendum #	2	Date	12/14/23	Initials	
Addendum #	3	Date	12/27/23	Initials	
Addendum #	4	Date	12/29/23	Initials	
	5		1/5/24		

Firm Representative:

Signature/Date **(Executed by Corporate Authority)**

Gary Deremer, President
U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652
State of Incorporation: Florida

DRUG-FREE WORKPLACE FORM- ITB 2023-03

The undersigned vendor, in accordance with Florida Statute 287.087, hereby

certifies that U.S. Water Services Corporation does:
(Name of Business)

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business' policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or pleas of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm fully complies with the above requirements.

Bidder's Signature

Gary Deremer, President
U.S. Water Services Corporation
4939 Cross Bayou Blvd., New Port Richey FL 34652
State of Incorporation: Florida

January 12, 2024
Date

PUR062.036
re. 10/97

NON-COLLUSIVE AFFIDAVIT- ITB 2023-03

State of Florida
County of Pasco

Gary Deremer being first duly sworn. deposes and says that he/she is

President of U.S. Water Services Corporation the party making the fore-going submittal of qualifications or bid that such submittal
(partner or officer of the Firm, etc)

Or bid is genuine and not collusive or sham; that said Firm has not colluded, conspired, connived or agreed, directly or indirectly, with any Firm or person, to put in a sham response or to refrain from responding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person, to secure any advantage against the City of Zephyrhills of any person interested in the proposed contract; and that all statements in said response are true.

Officer Gary Deremer, President
State of Incorporation: Florida

U.S. Water Services Corporation *(Company Name)*
4939 Cross Bayou Blvd., New Port Richey FL 34652

State of Florida
County of Pasco

The foregoing instrument was acknowledged before me this 12th day of January 2024
by
Gary Deremer, President *(name and title of corporate officer)*
of U.S. Water Services Corporation *(Name of Corporation),*
a Florida *(state or place of incorporation)* corporation, on behalf of the corporation. He/she is personally known to me or has produced _____ *(Identification type)*
as identification.

Christina R. Crego *(Signature line for notary public)*

Christina R. Crego *(Name of notary type, printed or stamped)*

_____ *(Title or rank)*

My commission expires: January 26, 2025
Serial number, if any _____

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

Errors or Omissions- ITB 2023-03

Upon review of this project's plans and construction documents are you aware of any apparent errors or omissions?

☐ YES

☒ No

If YES, please provide a detailed explanation of any apparent errors or omissions on this sheet.

January 12, 2024

Company Representative **Date**

Gary Deremer, President
U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652
State of Incorporation: Florida

REFERENCES –PROJECTS OF SIMILAR SCOPE- ITB 2023-03

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: Hernando County BOCC
Project Name: Hill-N-Dale WM Replacement Project Amount: $ 782,593.20
Start Date: 1/31/22 Finished Date: 11/14/23
Description: Installation of new water mains and fire hydrants in the Azen Loop service area of the Hill-n-Dale subdivision to replace the existing aging water mains and abandon the existing water mains and meters that are in the customers back yards and replace them with new water mains and meters that will be installed in the road right-of-way for easier maintenance.
Contact Name: Charles Turner, PM Phone: 352 540 6219
Email: cturner@hernandocounty.us Within Budget: YES ☒ NO ☐*Explain

Reference 2: Company Name: Hernando County BOCC
Project Name: Berkeley Manor Flow Diversion LS Rehab Project Amount: $ 742,165.28
Start Date: 1/13/22 Finished Date: 5/5/23
Description: installation of a new generator. The existing wet well, new valve vault, and new collector manhole will be coated per HCUD specifications Section 9. The station will receive a new electrical service and panel as well. There is approximately 900' of ten inch force main to be installed along with an approximately 170' of eight inch force main under US 19 via directional bore.
Contact Name: Brad Smith, PM Phone: 352 758 4858
Email: bsmith@hernandocounty.us Within Budget: YES ☒ NO ☐*Explain

Reference 3: Company Name: City of Hampton
Project Name: Water Main Loop Project Phase 2 Project Amount: $ 212,298.00
Start Date: 12/16/22 Finished Date: 8/8/23
Description: Loop water mains to improve water conservation, remove dead ends to improve water quality, reduce system flushing, and reduce water age associated with water stagnation at dead ends. New isolation valves to improve the capability to repair line breaks.
Contact Name: Mary Lou Hildreth Phone: 352 468 1201
Email: coh1@outlook.com Within Budget: YES ☒ NO ☐*Explain

Reference 4: Company Name: City of Leesburg
Project Name: FM Installation - Canal Street WWTF Project Amount: $ 96,416.63
Start Date: 8/2/21 Finished Date: 11/9/21
Description: Replacement of a force main from an existing 16-inch ductile iron force main over to a new 16-inch C900 PVC force main. The old ductile iron force main will then be abandoned and shall be grout filled with flowable fill and properly capped.
Contact Name: Ryan Gerdon Phone: 352 705 0248
Email: Ryan.gerdon@leesburgflorida.gov Within Budget: YES ☒ NO ☐*Explain

REFERENCES –PROJECTS OF SIMILAR SCOPE- ITB 2023-03

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: City of Hampton
Project Name: Water Main Loop Project Project Amount: $158,717.59
Start Date: 7/2/21 Finished Date: 9/30/21
Description: Loop water mains to improve water conservation, remove dead ends to improve water quality, reduce system flushing, and reduce water age associated with water stagnation at dead ends. New isolation valves to improve the capability to repair line breaks.

Contact Name: Mary Lou Hildreth Phone: 352 468 1201
Email: coh1@outlook.com Within Budget: YES ☒ NO ☐*Explain

Reference 2: Company Name: City of Leesburg
Project Name: Gravity Main-Pamela Street - 210171 Project Amount: $ 178,931.00
Start Date: 8/2/21 Finished Date: 9/15/21
Description: Relocate existing sewer main. A new sewer main will be constructed and the old sewer main abandoned in place with flowable fill.

Contact Name: Ryan Gerdon Phone: 352 705 0248
Email: Ryan.Gerdon@leesburgflorida.gov Within Budget: YES ☒ NO ☐*Explain

Reference 3: Company Name: City of Waldo
Project Name: CDBG 18 NR Water Main Replacements Project Amount: $ 410,220.35
Start Date: 5/18/20 Finished Date: 3/22/21
Description: The Project consisted of furnishing all labor, equipment, and materials necessary to construct approximately 4,200 LF of 6" PVC water mains, including valves, fittings, fire hydrants, water services, and associated restoration; and the rehabilitation of Lift Station No. 1, including new pumps, piping, control panel, etc.
Contact Name: Timothy Norman, P.E. Phone: 904 278 0030
Email: Tnorman@mittauer.com Within Budget: YES ☒ NO ☐*Explain

Reference 4: Company Name: FGUA
Project Name: Colonial Manor WM Replacement, CSP08 Project Amount: $ 1,566,312.29
Start Date: 10/8/18 Finished Date: 3/11/21
Description: Replace approx' 8,504 LF of WM in the Colonial Manor development. Installation of new WM within the ROW, installation of new service connections, relocation of existing meters to be installed in new meter boxes, removal of existing meter boxes, installation of new service laterals, installation of fire hydrants, and grouting in place existing water mains (4" and greater only). Surveys, maintenance of traffic, sodding and site restoration.
Contact Name: Robert Dickson, P.E. Phone: 407 629 6900
Email: rdickson@govmserv.com Within Budget: YES ☒ NO ☐*Explain

REFERENCES –FOR CURRENTLY ACTIVE PROJECTS- ITB 2023-03

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: FGUA (Florida Governmental Utility Authority)
Project Name: 180th Ave Package Plant Abatement Project Amount: $ 706,474.00
Start Date: 8/7/2023 Finished Date: in progress
Description: Work of the Project includes construction of approximately 2,220 liner feet (LF) of 4-inch force main by open trench excavation and 500 linear feet (LF) of force main by horizontal directional drilling (HDD)

Contact Name: Jordan Jayashekaramurthy, CPM GSG Phone: 407 629 6900
Email: jodanjay@govmserv.com Within Budget: YES ☒ NO ☐*Explain

Reference 2: Company Name: FGUA (Florida Governmental Utility Authority)
Project Name: Jungle Den Inflow & Infiltration Correction and LS Upg Project Amount: $ 2,582,935.00
Start Date: 6/6/2023 Finished Date: in progress
Description: see following page

Contact Name: Robert Gonzalez, P.E. Phone: 407 425 0452
Email: rgonzalez@cphcorp.com Within Budget: YES ☒ NO ☐*Explain

Reference 3: Company Name: Pasco County BOCC
Project Name: Pasco Aqua Utility System Improvements Project Amount: $ 3,996,354.14
Start Date: 10/25/22 Finished Date: in progress
Description: see following page

Contact Name: Kurt Heath, P.E. Phone: 813 760 1964
Email: Kurt@stroudengineering.com Within Budget: YES ☒ NO ☐*Explain

Reference 4: Company Name: City of Casselberry
Project Name: PW 2007 Sausalito FM Replacement Project Amount: $ 1,501,270.90
Start Date: 6/27/22 Finished Date: in progress
Description: Install approx 6,000 LF of 10-inch FM consisting of; Repair sidewalk, driveway and asphalt road; Coordinate with City to re-direct flow from existing lift stations (open and closing valves), in order to have existing FM without flow; Restoration of site landscaping, irrigation, roadway and other affected facilities; Connection to existing Lift Station piping and existing Force Main on South Winter Park Drive;
Contact Name: Stefano Ceriana Phone: 407 917 5697
Email: sceriana@chacompanies.com Within Budget: YES ☒ NO ☐*Explain

Ref #2
- Relocate LS 01: One (1) 8 ft dia. wet well with dual pumps, valves above ground, new electrical panel and generator on-site. Connect gravity sewer and force main: one (1) MH, approx 446 LF of 8-inch PVC gravity main and approx 56 LF of 4-inch PVC force main to be connected to 6-inch PVC at the WWTF Headworks.
- Relocate LS 02: One (1) 6 ft dia. wet well with dual pumps, valves above ground, new electrical panel. Connect gravity sewer and force main: two (2) MHs, approx 225 LF of 8-inch PVC gravity main, approx 25 LF of 4-inch PVC force main and extend approx 60 LF of 6-inch PVC lateral for Condominiums to the new MH.
- Repair and replace gravity sewer: At Jungle Den Villas Condominiums install approx 279 LF of 8-inch PVC gravity main and add one (1) MH to relocate the gravity sewer into the existing utility easement. On Juno Trail Road, Alice Drive and River Road line and repair approx 3,000 LF of gravity
Ref #3
At the Jasmine Lakes community, installation of a new sewer conveyance and pumping system, including a new duplex lift station, 710 linear feet of 6-inch diameter PVC force main piping, and 470 linear feet of 8-inch diameter PVC force main piping by open cut methods. The force main piping work requires the removal of abandoned utility piping, including 900 linear feet of 12-inch diameter PVC piping and 800 linear feet of 8-inch diameter asbestos cement piping. Upon completion and activation of the new pumping system, the existing wastewater treatment facility shall be abandoned and demolished. The work shall also include installation of a new primary and secondary potable water connection for the community, including 690 linear feet of 8-inch diameter PVC water main piping by open cut methods and two (2) aboveground meter and control valve assemblies. At the Palm Terrace community, installation of a new gravity sewer collection and pumping system, including 250 linear feet of gravity sewer piping, four (4) manholes, a new duplex lift station, 1,710 linear feet of 6-inch diameter PVC force main piping by open cut methods, and 2,140 linear feet of 6-inch diameter HDPE force main piping by horizontal directional drilling methods along Ranch Road, with three (3) separate drill lengths. Upon completion and activation of the new pumping system, the existing wastewater treatment facility shall be abandoned and demolished. The work shall also include installation of a new secondary potable water connection for the community, including 140 linear feet of 6-inch diameter PVC water main piping and an aboveground meter and control valve assembly. At the Zephyr Shores community, installation of a new primary and secondary potable water connection for the community, including 200 linear feet of 6-inch diameter PVC water main piping, 120 linear feet of 8-inch diameter PVC water main piping, 50 linear feet of 16-inch diameter steel casing by jacking and boring methods, an aboveground meter and backflow prevention assembly, and an aboveground meter and control valve assembly

REFERENCES –FOR CURRENTLY ACTIVE PROJECTS- ITB 2023-03

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: American Beach Water and Sewer District
Project Name: Well and Septic Tank Phase Out Program Project Amount: $ 7,831,538.00
Start Date: 6/6/2022 Finished Date: in progress
Description: The project includes the installation of approximately 12,400 linear feet of 8" PVC gravity pipe within the existing American Beach community via open-cut installation. (additional information at the bottom of page)

Contact Name: Teresa Irby-Butler, P.E. Phone: 407 629 6900
Email: teresa.irby-butler@fgua.com Within Budget: YES ☒ X NO ☐*Explain

Reference 2: Company Name:
Project Name: Project Amount: $
Start Date: Finished Date:
Description:

Contact Name: Phone:
Email: Within Budget: YES ☐ NO ☐*Explain

Reference 3: Company Name:
Project Name: Project Amount: $
Start Date: Finished Date:
Description:

Contact Name: Phone:
Email: Within Budget: YES ☐ NO ☐*Explain

Reference 4: Company Name:
Project Name: Project Amount: $
Start Date: Finished Date:
Description:

Contact Name: Phone:
Email: Within Budget: YES ☐ NO ☐*Explain

A. The project includes the installation of approximately 12,400 linear feet of 8" PVC gravity pipe within the existing American Beach community via open-cut installation. The open cut will occur in the center of each roadway as identified in the contract drawings. Installation of the gravity sewer system includes the installation of approximately 42 precast concrete manholes, pipe fittings, and sewer laterals to the edge of the right of way. Manhole interior and exterior surfaces shall be coated per JEA standards.
B. The proposed gravity sewer system includes the installation of two new lift stations. Each lift station shall be equipped with submersible pumps, control panels, level control, and mission communications as identified in the contract drawings. The lift station wet wells shall be coated and lined per JEA standards.
C. The proposed sewer system includes approximately 2,600 linear feet of 4-inch PVC force main and associated appurtenances as shown on the contract drawings. All materials and protective linings and coatings for corrosion protection shall abide by JEA standards.
D. Sewer service laterals shall be provided to the parcels shown on the contract drawings. Installation of sewer service laterals shall be within the public right-of-way and shall terminate at the private property lines with above grade, visible demarcation per JEA
standard details.
E. The proposed potable water main system includes the installation of approximately 12,300 linear feet new PVC pipe via open-cut installation. Pipe diameters will be 4-inch, 6-inch, and 8-inch as shown on the contract drawings. Installation of the potable water main system includes approximately 16 fire hydrants, approximately 287 service laterals, water meter boxes at all occupied parcels, and water main isolation valves and boxes.
F. Contractor shall be responsible for the relocation of gopher tortoises within the project boundaries and as required by all applicable permits.
G. Roadways shall be resurfaced at the conclusion of the project and to the extent as identified on the contract drawings. Contractor shall be responsible for maintenance of traffic during the entire duration of the project.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion Form- ITB 2023-03

1. The prospective Vendor, U.S. Water Services Corporation, certifies, by submission of this document, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any Federal Department or Agency.

2. Where the Vendor is unable to certify to the above statement, the prospective Vendor shall attach an explanation to this form.

Vendor: U.S. Water Services Corporation
Name of Company – Please Print

Signature:
Authorized Company Representative

Name/Title: Gary Deremer, President

Address: 4939 Cross Bayou Blvd.,
New Port Richey FL 34652
State of Incorporation: Florida

Date: January 12, 2024

CERTIFICATION OF CONTRACTOR REGARDING TRENCH SAFETY- ITB 2023-03

This certification is required pursuant to the Trench Safety Act, Chapter 90-98, Florida Statutes regarding Trench Safety. The Act specifically incorporates the Occupational Safety and Health Administration's excavation safety standards, 29 CFR S. 1928.650 Subpart P as the State standard. Any revision to OSHA's safety standards that are consistent with the Florida Statues shall also be complied with upon its effective date. The act requires that any bidder or prospective contractor, or any of their proposed subcontractors, shall provide written assurance that the contractor will comply with the applicable trench safety standards.

Name of Contractor: U.S. Water Services Corporation

Address: 4939 Cross Bayou Blvd.,
New Port Richey FL 34652

Phone: 727 848 8292

1. Contractor agrees that he is aware of the Trench Safety Act and the requirements of the Act.
2. Contractors agrees to comply with all applicable trench safety standards as set forth in the Act and as referenced in the Act.

Name of Signer: Gary Dermer
PLEASE PRINT

Title: President

Signature:

Date: January 12, 2024

U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652
State of Incorporation: Florida

Ron DeSantis, Governor

Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE UNDERGROUND UTILITY & EXCAVATION CO HEREIN IS CERTIFIED UNDER THE PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

DEREMER, GARY ANDREW

US WATER SERVICES CORPORATION
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY FL 34652

LICENSE NUMBER: CUC1223914

EXPIRATION DATE: AUGUST 31, 2024

Always verify licenses online at MyFloridaLicense.com

Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.

Ron DeSantis, Governor

Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE GENERAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

DELCHER, CECIL R

U S WATER SERVICES CORPORATION
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY FL 34652

LICENSE NUMBER: CGC003307

EXPIRATION DATE: AUGUST 31, 2024

Always verify licenses online at MyFloridaLicense.com

Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

▶ **Go to *www.irs.gov/FormW9* for instructions and the latest information.**

Give Form to the requester. Do not send to the IRS.

Print or type. See **Specific Instructions** on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

U.S. Water Services Corporation

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☑ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

4939 Cross Bayou Boulevard

Requester's name and address (optional)

6 City, state, and ZIP code

New Port Richey, FL 34652

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN,* later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

2	0	–	0	0	0	8	8	2	1

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here Signature of U.S. person ▶ Edward Mukeen Date ▶ 02/28/2019

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9.*

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

Detail by Entity Name

Florida Profit Corporation
U.S. WATER SERVICES CORPORATION

Filing Information

Document Number	P03000047833
FEI/EIN Number	20-0008821
Date Filed	04/30/2003
Effective Date	04/28/2003
State	FL
Status	ACTIVE
Last Event	AMENDED AND RESTATED ARTICLES
Event Date Filed	03/31/2020
Event Effective Date	NONE

Principal Address

4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Changed: 03/31/2004

Mailing Address

4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Changed: 05/09/2005

Registered Agent Name & Address

DEREMER, GARY A
4939 CROSS BAYOU BOULEVARD

NEW PORT RICHEY, FL 34652

Name Changed: 03/31/2020

Address Changed: 03/31/2020

Officer/Director Detail

Name & Address

Title CEO

DEREMER, GARY
4939 CROSS BAYOU BLVD.
NEW PORT RICHEY, FL 34652

Title VP

DELCHER, CECIL
4939 CROSS BAYOU BLVD.
NEW PORT RICHEY, FL 34652

Title VP

AMIOTT, RALPH
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

KADER, MOHAMMED
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP, Secretary

Mitchell, Edward
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title CFO

RUPE, KAYCEE
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

SALIBA, CHRIS
4939 CROSS BAYOU BOULEVARD

NEW PORT RICHEY, FL 34652

Title VP

RENDELL, WILLIAM TROY
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

DUPONT, JEFFREY
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

VOSS, AARON
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title SVP

Elias, Dan
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title SVP

Jones, Kenneth
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

Benderski, Ron
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

SCHULTZ, DAVID, Jr.
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Annual Reports

Report Year	Filed Date
2021	01/20/2021
2022	01/24/2022

2023	01/11/2023

Document Images

01/11/2023 -- ANNUAL REPORT	View image in PDF format
01/24/2022 -- ANNUAL REPORT	View image in PDF format
01/20/2021 -- ANNUAL REPORT	View image in PDF format
03/31/2020 -- Amended and Restated Articles	View image in PDF format
01/16/2020 -- ANNUAL REPORT	View image in PDF format
09/25/2019 -- Amendment	View image in PDF format
04/04/2019 -- ANNUAL REPORT	View image in PDF format
03/02/2018 -- ANNUAL REPORT	View image in PDF format
04/24/2017 -- ANNUAL REPORT	View image in PDF format
04/15/2016 -- ANNUAL REPORT	View image in PDF format
02/19/2015 -- ANNUAL REPORT	View image in PDF format
02/26/2014 -- ANNUAL REPORT	View image in PDF format
03/18/2013 -- ANNUAL REPORT	View image in PDF format
04/19/2012 -- ANNUAL REPORT	View image in PDF format
04/13/2011 -- ANNUAL REPORT	View image in PDF format
04/02/2010 -- ANNUAL REPORT	View image in PDF format
04/29/2009 -- ANNUAL REPORT	View image in PDF format
03/31/2008 -- ANNUAL REPORT	View image in PDF format
04/30/2007 -- ANNUAL REPORT	View image in PDF format
04/30/2006 -- ANNUAL REPORT	View image in PDF format
05/09/2005 -- ANNUAL REPORT	View image in PDF format
03/31/2004 -- ANNUAL REPORT	View image in PDF format
08/07/2003 -- Amendment	View image in PDF format
06/09/2003 -- Off/Dir Resignation	View image in PDF format
04/30/2003 -- Domestic Profit	View image in PDF format

Previous On List Next On List Return to List

us water services
Search

Events **No Name History**

City Council Meeting
February 26, 2024

Action Item

CONSENT ITEMS 2.6

Approval of Agreement No. 25-24-02 with US Water for the South 301 Water and Sewer Improvement Project

Issue:

Award Bid Number ITB 2023-03 for the South 301 Water and Sewer Improvement Project to US Water

Background:

This project will allow the City to better serve the area south of C Avenue to the Tucker Rd. area mainly along Hwy 301, with the opportunity to serve additional parcels east and west of the highway.

Attachment(s):

1. 30377140v2 - Contract for Construction - US Water - South 301 W Water and Wastewater Pipeline Project 25-24-02
2. 25-24-02 Exhibit A South US-301 Water and Wastewater Pipeline
3. 25-24-02 Exhibit B South US-301 Water and Wastewater Pipeline
4. 25-24-02 Exhibit C South US-301 Water and Wastewater Pipeline
5. 25-24-02 Exhibit D South US-301 Water and Wastewater Pipeline

Fiscal Impact:

The City received 10 responses ranging from $999,765.80 to 2,967,165.00.
The estimated costs for the project was $1.7 million with a low bid from US Water for $999,765.80, with a 10% contingency. A portion of this project is funded by the FDEP in the amount up to $650,000.00.

Staff Recommendation:

Staff recommends to the City Council to approve the contract as presented

CITY OF ZEPHYRHILLS CONTRACT 25-24-02
SOUTH 301 W WATER AND WASTEWATER PIPELINE

THIS CONSTRUCTION AGREEMENT ("Agreement") is made and entered into this **26th** day of **February, 2024** by and between the **CITY OF ZEPHYRHILLS**, a Florida municipal corporation, having its principal office at 5335 8th Street, Zephyrhills, FL 33542 ("City") and **US WATER SERVICES CORPORATION,** a Florida corporation organized and authorized to do business in the State of Florida, having its principal office at 4939 Cross Bayou Boulevard, New Port Richey, FL 34652 ("Contractor"). The City and Contractor shall collectively be referred to as the "Parties", and each may individually be referred to as a "Party".

ARTICLE 1 – RECITALS

1.1 The recitals are true and correct and are hereby incorporated into and made a part of this Agreement.

ARTICLE 2 – CONTRACT DOCUMENTS

2.1 The following documents, collectively referred to as the "Contract Documents", are incorporated into and made part of this Agreement:

2.1.1 City Bid ITB 2023-03, South 301 W Water and Wastewater Pipeline "**Exhibit A**".

2.1.2 City Bid ITB 2023-03 Technical Specifications **"Exhibit B"**.

2.1.3 City Bid ITB 2023-03 Plans **"Exhibit C"**.

2.1.4 Contractor's response to Item 2.1.1, attached hereto as "**Exhibit D**".

ARTICLE 3 – TERM OF AGREEMENT

3.1 Subject to authorized adjustments, the Term of this Agreement shall be up to a maximum of **Four Hundred Sixty (460)** calendar days from Notice to Proceed. During the pre-project meeting the awardee will provide the Owner the number of weeks which will take for the equipment to be delivered. Once delivered a Notice to Proceed will be issued which will start the 365 calendar days.

3.3 When, in the opinion of the City, reasonable grounds for uncertainty exist with respect to the Contractor's ability to perform Services or any portion thereof, the City may request that the Contractor, within a reasonable time frame set forth in the City's request, provide adequate assurances to the City in writing, of Contractor's ability to perform in accordance with terms of this Agreement. In the event that the Contractor fails to provide the City the requested assurances within the prescribed time frame, the City may treat such failure as a repudiation or breach of the Agreement, and resort to any remedy for breach provided for in this Agreement or at law.

ARTICLE 4 – COMPENSATION

4.1 Contract is awarded to a maximum of **$999,765.80 (includes $90,887.80 contingency)**. Compensation for services shall be as per outlined in Contractors response, attached as Exhibit D. The City will be processing payments via ACH/EFT. (See Forms)

4.2 The City shall pay Contractor within forty-five (45) days of receipt of invoice the total shown to be due on such invoice, provided the City has accepted the Services.

ARTICLE 5 – SCOPE OF SERVICES

5.1 Contractor shall provide all labor, supervision, materials, equipment, tools, services, monitoring and expertise necessary for the completion of Services, in accordance with the specifications, terms and conditions contained in the Contract Documents. Contractor shall perform the Services in accordance with that degree of care and skill ordinarily exercised by reputable members of its profession.

5.2 This contract has been enhanced to include other City services as required, i.e., storm water or other related public works projects as awarded by the City Council.

5.3 Contractor represents and warrants to the City that: (i) Contractor possesses all qualifications, licenses and expertise required for the provision of Services, with personnel fully licensed by the State of Florida; (ii) Contractor is not delinquent in the payment of any sums due the City, including payment of permit fees, local business taxes, or in the performance of any obligations to the City; (iii) All personnel assigned to perform work shall be, at all times during the term hereof, fully qualified and trained to perform the tasks assigned to each; (iv) the Services will be performed in the manner and at such times and locations as described by the City for the budgeted amount; and (v) The person executing this Agreement on behalf of the Contractor is duly authorized to execute same and fully bind Contractor as a party to this Agreement.

5.4 **Contractor shall not subcontract part(s) of the work, the aggregate cost of which is greater than 50 percent of the contract price, without prior written approval by Owner**. Contractor shall cause appropriate provisions to be inserted in each subcontract making the Owner and Engineer a third party beneficiary of such subcontract and to give Contractor the same power as regards terminating any subcontract that Owner may exercise over Contractor under any provision of the Contract Documents. Each Subcontractor shall discharge all duties and responsibilities of Contractor to Owner covered by his subcontract.

5.5 Contractor agrees and understands that: (i) any and all subcontractors used by Contractor shall be paid by Contractor and not paid directly by the City; and (ii) any and all liabilities regarding payment to, or use of subcontractors for any of the work related to this Agreement, shall be borne solely by Contractor.

5.6 Contractor warrants that any and all work, materials, services or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result, will be supplied by the Contractor at its own cost, whether or not specifically called for.

5.7 The Services shall be completed by the Contractor to the satisfaction of the City. The City shall make decisions on all claims regarding interpretation of the Agreement and on all other matters relating to the execution, progress and quality of the Services.

ARTICLE 6 – CITY'S TERMINATION RIGHTS

6.1 The City shall have the right to terminate this Agreement, in its sole discretion at any time, with or without cause, upon fifteen (15) days written notice to Contractor. In such event, the City shall pay Contractor compensation for Services rendered prior to the effective date of termination. The City shall not be liable to Contractor for any additional compensation, or for any consequential or incidental damages.

ARTICLE 7 – INDEPENDENT CONTRACTOR

7.1 Contractor has been procured and is being engaged by the City as an independent contractor, and not as an agent or employee of the City. Accordingly, Contractor shall not attain, not be entitled to, any rights or benefits under the Ordinances of the City, nor any rights generally afforded classified or unclassified employees of the City.

Contractor further understands that Florida workers' compensation benefits available to employees of the City, are not available to Contractor. Therefore, Contractor agrees to provide workers' compensation insurance for any employee or agent of Contractor rendering services to the City under this Agreement.

ARTICLE 8 – CONFLICTS OF INTEREST

8.1 The Contractor represents and warrants to the City that it has not employed or retained any person or company employed by the City to solicit or secure this Agreement and that it has not offered to pay, paid, or agreed to pay any person any fee, commission, percentage, brokerage fee, or gift of any kind contingent upon or in connection with, the award of this Agreement.

8.2 Contractor covenants that no person under its employ who presently exercises any functions or responsibilities on behalf of the City in connection with this Agreement has any personal financial interest, directly or indirectly with Contractor. Contractor further covenants that, in the performance of this Agreement, no person having such conflicting interest shall be employed.

ARTICLE 9 – DEFAULT

9.1 If Contractor fails to comply with any term or condition of this Agreement, or fails to perform any of its obligation hereunder, then Contractor shall be in default. The City shall have the right to terminate this Agreement, in the event Contractor fails to cure a default within ten (10) business days after receiving Notice of Default. Contractor understands and agrees that termination of this Agreement under this section shall not release Contractor from any obligations accruing prior to the effective date of termination.

ARTICLE 10 – NOTICES

10.1 All notices, demands, correspondence and communication between the City and Contractor shall be deemed sufficiently given under the terms of this Agreement when delivered by personal service, faxed, or dispatched by mail or certified mail, addressed as follows:

To CONTRACTOR:

US Water Services Corporation
Attn: Christina Crego
4939 Cross Bayou Boulevard
New Port Richey, FL 34652
ccrego@uswatercorp.net

To CITY:

City of Zephyrhills
ATTN: William C. Poe, Jr., City Manager
5335 8th Street
Zephyrhills, Florida 33542
wpoe@ci.zephyrhills.fl.us

And,

City of Zephyrhills
ATTN: Matthew E. Maggard, City Attorney
5335 8th Street
Zephyrhills, Florida 33542
mmaggard@ci.zephyrhills.fl.us

10.2 Either Party may at any time designate a different address and/or contact person by giving notice as provided above to the other Party. Such notices shall be deemed given upon receipt by the addressee.

10.3 In the event there is a change of address and the moving Party fails to provide notice to the other Party, then notice sent as provided in this Article shall constitute adequate notice.

ARTICLE 11 – PUBLIC RECORDS

11.1 **IF THE CONSULTANT/CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONSULTANT'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT 813-780-0000, EXT. 3543 OR CITYCLERK@CI.ZEPHYRHILLS.FL.US OR CITY CLERK, CITY OF ZEPHYRHILLS, 5335 EIGHTH STREET, ZEPHYRHILLS, FLORIDA 33542.**

ARTICLE 12 – INDEMNIFICATION

12.1 Contractor shall defend, indemnify and hold harmless the City of Zephyrhills and all of the City of Zephyrhills's officers, agents, and employees from and against all claims, liability, loss and expense, including reasonable costs, collection expenses, attorneys' fees, and court costs which may arise because of the negligence (whether active or passive), misconduct, or other fault, in whole or in part (whether joint, concurrent, or contributing), of Contractor, its officers, agents or employees in performance or non-performance of its obligations under the Agreement. Contractor recognizes the broad nature of this indemnification and hold harmless clause, as well as the provision of a legal

defense to the City of Zephyrhills when necessary, and voluntarily makes this covenant and expressly acknowledges the receipt of such good and valuable consideration provided by the City of Zephyrhills in support of these indemnification, legal defense and hold harmless contractual obligations in accordance with the laws of the State of Florida. This clause shall survive the termination of this Agreement. Compliance with any insurance requirements required elsewhere within this Agreement shall not relieve Contractor of its liability and obligation to defend, hold harmless and indemnify the City of Zephyrhills as set forth in this article of the Agreement.

Nothing herein shall be construed to extend the City of Zephyrhills's liability beyond that provided in section 768.28, Florida Statutes.

ARTICLE 13 – INSURANCE

13.1 Contractor shall, at its sole cost and expense, procure and maintain throughout the term of this contract, Comprehensive General Liability and Worker's Compensation insurance, including Employer Liability insurance, with minimum policy limits of $ 1,000,000 (this could be $2,000,000 depending on the amount of the contract) Combined Single Limits, or to the extent and in such amounts as required and authorized by Florida law, and will provide endorsed certificates of insurance generated and executed by a licensed insurance broker, brokerage or similar licensed insurance professional evidencing such coverage, and naming the City of Zephyrhills as a named, additional insured, as well as furnishing the City of Zephyrhills with a certified copy, or copies, of said insurance policies. Certificates of insurance and certified copies of these insurance policies must accompany this signed contract. Said insurance coverages procured by Contractor as required herein shall be considered, and Contractor agrees that said insurance coverages it procures as required herein shall be considered, as primary insurance over and above any other insurance, or self–insurance, available to the City of Zephyrhills, and that any other insurance, or self-insurance available to the City of Zephyrhills shall be considered secondary to, or in excess of, the insurance coverage(s) procured by Contractor as required herein.

Nothing herein shall be construed to extend the City of Zephyrhills's liability beyond that provided in section 768.28, Florida Statutes.

13.2 If this Contract includes: (1) construction of a new above-ground structure or structures, or (2) any addition(s), improvement(s), alteration(s), or repair(s), to an existing above-ground structure or structures, or (3) the installation of machinery or equipment into an existing structure or structures, the Contractor shall provide, in a policy acceptable to the City, "all risk" (i.e. Special Form) property insurance on any such construction, additions, machinery or equipment. The amount of the insurance shall be no less than the estimated replacement value at the time of the City's final acceptance of such new structures, addition(s), improvement(s), alteration(s), repair(s), machinery or equipment. The coverage shall not be subject to any restriction with respect to occupancy or use by the City and, subject to thirty (30) days' prior written notice to the City shall remain in full effect until final acceptance by the City. In addition, the City, the Professional, and the Contractor's subcontractors of any tier, shall be additional insureds on this policy. The insurance shall include a deductible no greater than one percent (1%) of the Contract amount, or $25,000, whichever is smaller, for which the Contractor shall be responsible. The risk of loss whether insured or not shall remain with the

Contractor until final acceptance. Upon request, Contractor shall furnish to the City complete copies of the insurance policy.

ARTICLE 14 – FORCE MAJEURE

14.1 A "Force Majeure Event" shall mean an act of God, act of governmental body or military authority, fire, explosion, power failure, flood, storm, hurricane, sink hole, other natural disasters, epidemic, riot or civil disturbance, war or terrorism, sabotage, insurrection, blockade, or embargo. In the event that either Party is delayed in the performance of any act or obligation pursuant to or required by the Agreement by reason of a Force Majeure Even, the time for required completion of such act or obligation shall be extended by the number of days equal to the total number of days, if any, that such Party is actually delayed by such Force Majeure Event.

The Party seeking delay in performance shall give notice to the other Party specifying the anticipated duration of the delay, and if such delay shall extend beyond the duration specified in such notice, additional notice shall be repeated no less than monthly so long as such delay due to a Force Majeure Event continues. Any Party seeking delay in performance due to a Force Majeure Event shall use its best efforts to rectify any condition causing such delay and shall cooperate with the other Party to overcome any delay that has resulted.

ARTICLE 15 – CHANGE ORDERS

15.1 Without invalidating the Agreement, the City may, at any time or from time to time, order additions, deletions, or revisions in the work authorized by an executed, signed Change Order. Change Orders should be submitted to the City for review and shall incorporate all unchanged terms. Change Orders are a defined written instrument using AIA Document G701-2017 and be prepared by the Contractor and signed by both Contractor and authorized City representative.

Upon receipt of an executed authorized Change Order, the Contractor shall proceed with the work involved. All such work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment will be made.

The Department Director may authorize changes or alterations in the work not involving extra cost and not inconsistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order. If any minor change or alteration will result in an increase in the Contract Price, the Contractor must submit the proposed change to the City in writing, in the form of a change order.

The Contractor shall not start work on any alteration requiring an increase or decrease in price or extension of time until a Change Order setting forth the adjustments is executed by the City.

It is the Contractor's responsibility to notify his Surety of any changes affecting the general scope of the work or change in the Contract Price and the amount of the applicable Bonds shall be adjusted accordingly. The Contractor shall furnish proof of such adjustment to the City prior to performing work as outlined in the change order.

ARTICLE 16 – MISCELLANEOUS PROVISIONS

16.1 No waiver or breach of any provision of this Agreement shall constitute a waiver of any subsequent breach of the same or any other provision hereof, and no waiver shall be effective unless made in writing.

16.2 All representations, indemnifications, warranties and guarantees made in, required by, or given in accordance with this Agreement, as well as all continuing obligations indicated in the Contract Documents, shall survive final payment, completion and acceptance of the Services and termination or completion of the Agreement.

16.3 Should any provision, paragraph, sentence, word or phrase contained in this Agreement be determined by a court of competent jurisdiction to be invalid, illegal or otherwise unenforceable under the laws of the State of Florida, such provision, paragraph, sentence, word, or phrase shall be deemed modified to the extent necessary in order to confirm with such laws, or if not modifiable, then same shall be deemed severable, and in either event, the remaining terms and provisions of this Agreement shall remain unmodified and in full force and effect or limitation of its use.

16.4 The City is exempt from Federal Excise and State taxes. The applicable tax exemption number or certificate shall be made available upon request.

16.5 This Agreement constitutes the sole and entire agreement between the Parties. No modification or amendments hereto shall be binding on either Party unless in writing and signed by both Parties.

16.6 This Agreement shall be construed and enforced according to the laws of the State of Florida. Venue in any proceedings between the Parties shall be in Pasco County, Florida.

16.7 The City reserves the right to audit the records of the Contractor covered by this Agreement at any time during the provision of Services and for a period of three (3) years after final payment is made under this Agreement.

16.8 The Contractor agrees that it shall not discriminate as to race, sex, color, creed, national origin, or disability, in connection with its performance under this Agreement.

16.9 The professional services to be provided by Contractor pursuant to this Agreement shall be non-exclusive, and nothing herein shall preclude the City from engaging other firms to perform Services.

16.10 This Agreement shall be biding upon the Parties herein, their heirs, executors, legal representatives, successors and assigns.

16.11 The Contractor agrees to comply with and observe all applicable federal, state, and local laws, rules, regulations, codes and ordinances, as they may be amended from time to time.

16.12 All other terms and conditions set forth in the Contract Documents which have not been modified by this Agreement, shall remain in full force and effect.

16.13 In the event of any dispute arising under or related to this Agreement, the prevailing Party shall be entitled to recover all actual attorney fees, costs and expenses incurred by it in connection with that dispute and/or the enforcement of this Agreement, including all such actual attorney fees, costs and expenses at all judicial levels, including appeal, until such dispute is resolved with finality.

16.14 This Agreement may be executed in two or more counterparts, each of which shall constitute an original but all of which, when taken together, shall constitute one and the same Agreement.

IN WITNESS WHEREOF, the parties have executed this agreement on the day written above.

CITY OF ZEPHYRHILLS

_____
Lance A. Smith, Council President

Attest: _____
Lori L. Hillman, City Clerk

Signed, Sealed and Delivered
In the presence of:

US WATER SERVICES CORPORATION

_____
Witness

By: _____
Name: _____
Its: _____

_____
Witness

AGENCY:		INVITATION TO BID
CITY OF ZEPHYRHILLS ATTN: PURCHASING DEPT 5335 8TH STREET ZEPHYRHILLS, FL 33542	Zephyrhills jump right in	Response Acknowledgement
PURCHASING AGENT: Karen Miller Phone: 813-780-0000 x3536 Email: kmiller@ci.zephyrhills.fl.us	AN EQUAL OPPORTUNITY EMPLOYER FLORIDA TAX EXEMPT #85-8012740166C-4 FEDERAL IDENTIFICATION NUMBER #59-6000455	

Obtained ALL Bid Documents and Submit Q&A and Responses electronically on: OPENGOV - LINK ON WEBSITE WWW.CI.ZEPHYRHILLS.FL.US

BID/PROPOSAL NUMBER	DISTRIBUTION DATE	BID/PROPOSAL TITLE	BID/PROPOSAL RESPONSES OPENING DATE/TIME
ITB 2023-03	11/20/2023	South 301 W Water & Wastewater Pipeline	OpenGov Online- Friday, January 12, 2024 before 1 PM

TELE CONFERENCE DATE GoTo Meetng ☒ Strongly Recommended ☐ None

DATE: 12-4-2023 TIME: 10:00 AM 2nd Floor Conference Room

GoTo LINK: https://meet.goto.com/159259221 Or, City Hall-2nd Flr Conf Rm

Call: 1-335-602-4523 ACCESS CODE: 269-369-332

RESPONSES RECEIVED AFTER ABOVE DATE AND TIME WILL NOT BE ACCEPTED

Bid Bonds must be received

SITE VISIT: After the Meeting

VENDOR MUST COMPLETE THE BELOW AREAS AND RETURN FORM, NOTARIZED. FORM IS REQUIRED.

RESPONDER'S NAME/ADDRESS:

TELPHONE NUMBER:

EMAIL ADDRESS:

If returning as a "NO" state reason:

I certify this Response is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a Response for the same materials, supplies or equipment, and is in all respects fair and without collusion or fraud. I agree to all conditions of this Bid/Proposal and certify that I am authorized to sign this Response for the company. In submitting a Response to the City of Zephyrhills the Responder offers and agrees that if this Response is accepted, the Company will convey, sell, assign or transfer to the City of Zephyrhills all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the Anti-trust laws of the United States and the State of Florida for price fixing relating to the particular commodities or services purchased or acquired by the City of Zephyrills. At the City's discretion, such assignment shall be made and become effective at the time the City tenders final payment to the Company.

FEDERAL EMPLOYER ID NUMBER OR SS NUMBER:

X

AUTHORIZED SIGNATURE

PRINTED NAME/TITLE

THIS FORM MUST BE NOTARIZED BELOW

Sworn to and subscribed to me this ___ day of _____, 2024

Personally known: ☐ Or produced identification: ☐

Type of ID: _____

_____ _____

Notary Signature State

My commission expires: _____

AFFIX NOTARY STAMP BELOW

BONDS

An EBond shall be included in your uploaded response or a certified check delivered to City Hall before the deadline for an amount not less than five (5%) of the total bid price and shall be made payable to the City as a guarantee that the Bidder will not withdraw his bid for a period of forty-five (45) days after bid closing time. Bid, Payment and Performance Bond and all Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

THE CITY OF ZEPHYRHILLS RESERVES THE RIGHT TO REJECT ANY OR ALL PROPOSALS, TO WAIVE INFORMALITIES, AND TO ACCEPT ALL OR ANY PART OF ANY RESPONSE/PROPOSAL AS MAY BE DEEMED TO BE IN THE BEST INTEREST OF THE CITY UNLESS OTHERWISE NOTED, PAYMENT OF GOODS OR SERVICES PROVIDED AS A RESULT OF THIS SOLICITATION WILL BE MADE PER FLORIDA STATUTE. ALL VENDORS MUST SUBMIT A COMPLETED W-9 FORM.

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BID RESPONSE FORM

Detailed Bid Form to be Submitted on Page 6, Technical Specifications

In accordance with the Specifications contained herein, I certify that any and all information contained in this bid response is true; and I further certify that this bid is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a bid for the same materials, supplies, equipment, or services and is in all respects fair and without collusion or fraud. I agree to abide by all terms and conditions of the bid, and certify that I am authorized to sign for the applicant firm. *Please print the following and sign your name.*

Amount of Base Bid	$ _____
10% Contingency *Contingency is not guaranteed.*	$ _____
Total Contract Sum (Amount of Bid + Contingency)	$ _____

Any contingency items shall be communicated by written change order and shall be approved by both the Owner and Contractor.

Total Contract Sum of Bid in Words: _____

_____

_____

The **BIDDER** must submit a bid on all items contained in specification or the bid shall be considered irregular. The **OWNER** reserves the right to accept or reject the bid. The **OWNER**, or his representative, further reserves the unqualified right to determine whether any particular item or items or materials, equipment, or whatsoever is an approved equal, and reserves the unqualified right to a final decision regarding the approval or rejection of the same. The bid selection shall be based on the apparent low bidder for the **"TOTAL CONTRACT SUM"**.

Add'l Documents Included:

- ☐ **Bid Form**
- ☐ **Bid Bond/Check**
- ☐ **References**
- ☐ **Public Entity Crimes**
- ☐ **License(s) copies**
- ☐ **Drug Free Workplace**
- ☐ **No-Bid**
- ☐ **Page 22, Signature/Seal**
- ☐ **Addenda Affidavit**
- ☐ **E-Verify**
- ☐ **Non Collusive**
- ☐ **Certification re: Debarment, Suspension, Ineligibility & Voluntary Exclusion**

NAME, ADDRESS, AND SIGNATURE OF BIDDER:

NAME: _____ **TITLE:** _____

ADDRESS: _____

PHONE: _____ **FAX:** _____

E-MAIL ADDRESS: _____

BIDDER SIGNATURE: _____ **DATE:** _____

Corporate Seal or Notarization below date

BID REQUIREMENTS

Bid documents, plans, addendums can be viewed and downloaded from **OPENGOV** at https://www.https://procurement.opengov.com/portal/zephyrhillsfl A link to **OPENGOV** can be found on the City's Website, www.ci.zephyrhills.fl.us, Click on Government, Purchasing, **OPENGOV**, SIGNUP and you will be able to follow our solicitation activity after signup. It is your responsibility to ensure you have downloaded all addendums published before the bid opening. You must be a registered vendor for the City of Zephyrhills. Registration is FREE. Your response and all required documentation are to be **submitted through OPENGOV electronically before the date and time listed for responses**.

Bid Bond: There are two methods of providing your solicitation bid bond. The **first** and preferred method is by an EBond which can be electronically uploaded with your solicitation response. The **second** method is to provide a certified check and deliver it to City Hall, 5335 8th Street, Zephyrhills, Florida 33542 before the deadline. Shall be for an amount not less than five percent (5%) of the total bid price and shall be made payable to the City as a guarantee that the Bidder will not withdraw his bid for a period of forty-five (45) days after bid closing time.

The Bid Bond (EBond or Certified Check) provides as a guarantee that if the bid proposal is accepted, the bidder will executed and execute the contract and furnish a Payment and Performance Bond at least equal to one hundred percent (100%) of the contract price within ten (10) days after Notice of Award of the contract.

The bid package language accommodates for all types of services and/or purchases.

TELE/PRE-CONFERENCE: This tele/pre-conference meeting is non-mandatory but **strongly** recommended to discuss the requirements of this solicitation. This has been scheduled for **Monday, December 4, 2023 at 10:00 AM**. This meeting will assure all bidders share the same information and have a fair opportunity to bid this project. It is recommended all vendors visit the locations to look at the requirements listed in this solicitation.

GoTo Link: **https://meet.goto.com/159259221**
Phone: **+1(224)501-3412**
Access Code: **159-259-221**

You may need to type the link as cutting/pasting may not work.

Payment and Performance Bond and All Insurance Shall be Secured from or Countersigned by an Agency or Surety Company Recognized in Good Standing and Authorized to do Business in the State of Florida. If at any time the Owner for justifiable cause shall be or become dissatisfied with any Surety, then upon the Performance of Payment Bonds, the Contractor/Vendor shall within ten (10) days after notice from the Owner, substitute an acceptable bond (or Bonds) in such form and sum and signed by such other Surety or Sureties as may be satisfactory to the Owner. The premiums on such bond shall be paid by the Contractor/Vendor. No further payments shall be deemed due and shall not be made until new Surety or Sureties shall have furnished such an acceptable bond to the Owner.

Indemnity: Contractor/vendor shall defend, indemnify and hold harmless the City of Zephyrhills and all of the City of Zephyrhills's officers, agents, and employees from and against all claims, liability, loss and expense, including reasonable costs, collection expenses, attorneys' fees, and court costs which may arise because of the negligence (whether active or passive), misconduct, or other fault, in whole or in part (whether joint, concurrent, or contributing), of contractor/vendor, its officers, agents or employees in performance or non-performance of its obligations under the Agreement generated from this solicitation. Contractor/vendor recognizes the broad nature of this indemnification and hold harmless cause, as well as the provision of a legal defense to the City of Zephyrhills when necessary, and voluntarily makes this covenant and expressly acknowledges the receipt of such good and valuable consideration provided by the City of Zephyrhills in support of these indemnification, legal defense and hold harmless contractual obligations in accordance with the laws of the State of Florida. This clause shall survive the

termination of the Agreement from this solicitation. Compliance with any insurance requirements required elsewhere within the Agreement shall not relieve the contractor/vendor of its liability and obligation to defend, hold harmless and indemnify the City of Zephyrhills as set forth in this article of the Agreement.

It is further agreed that liability and exposure for indemnification (including, but not limited to the amounts of any indemnification owed by a governmental entity) will be limited to and governed by the provisions of Section 768.28(5), Florida Statutes.

Exparte Communication: Please note that to insure the proper and fair evaluation of a bid proposal, the City of Zephyrhills prohibits exparte communication (i.e., unsolicited) initiated by a bidder to the City official or employee evaluating or considering the bids prior to the time a bid decision has been made. Any communication between bidder and the City will be initiated by the appropriate City official or employee inorder to obtain information or clarification needed to develop a proper and accurate evaluation of the bid. Any exparte communication may be grounds for disqualifying the offending bidder from consideration or award of the proposal then in evaluation or any future proposal.

INSTRUCTIONS TO BIDDERS

1. ***Proposals***: Responses/Proposals will be submitted through BidNet Direct meeting all requirements listed for furnishing all transportation, labor, material and equipment, and performing all operations required for the construction and completion of the work herein specified and shown on the drawings.

2. ***Additional Information or Clarification***: Request for additional information or clarifications must be made in writing and can be e-mailed to kmiller@ci.zephyrhills.fl.us or through BidNet Direct (preferred). Any request for additional information or clarification must be received in writing **no later than Friday, December 29, 2023 by 10:00 A.M.**

3. ***Equivalent Brand Names***: When the City does not wish to rule out other competitor's brands or makes, the phrase "OR EQUIVALENT" is specified. Whenever a material, article or piece of equipment is identified on the plans or in the specifications by reference to manufactures' or vendors' names, trade names, catalogue numbers, etc, it is intended merely to establish a standard; and, any material, article or equipment of other manufacturers and vendors that will perform adequately the duties imposed by the general design and will be considered equally acceptable provided the material, article or equipment so proposed, is, in the opinion of the Architect/Engineer, of equal substance and function. It shall not be purchased or installed by the Contractor/Vendor without the Architect/Engineer's written approval. However, if a product other than the specified bid, it is the bidder's responsibility to identify such product in its bid, and prove to the City that said product is equal to or better than the product specified. The City shall have the sole and absolute discretion to

   determine whether the product identified by the bidder is equal to or better than the product specified by the City. Manufacturers' certificates of specifications conformance of materials may be required by the City; these certificates shall be furnished at no cost to the City. Unless otherwise specified, evidence in the form of samples may be requested if the proposed brand is other than specified by the City. If samples should be requested, such samples must be received by the City within the time specified after a formal request is made. Any items which fall into this category are to be submitted to the City for review and approval no later **than Friday, December 29, 2023 by 10:00 A.M.**

4. ***Bidder***: A bidder is an individual, firm, or corporation submitting a Proposal to the City for the work contemplated.

5. ***Response Forms***: The bidder shall submit his Proposal on the forms furnished herewith. The blank spaces shall be filled in correctly for each lump sum item and for every item for which a quantity is given. The bidder shall state the price, typewritten or printed in ink, for which he proposes to do each item of work called for.

6. ***Signature on Response***: The bidder must sign his Response correctly. If the response is made by an individual, he shall sign and his name and his post office address shall be shown. If made by a firm or partnership, signature shall be by a general partner and the name and post office address of each member of the firm or partnership shall be shown. If made by a corporation, the person signing the Response shall show the name of the state under the laws of which the corporation was chartered, also the name and business address of its president, secretary and treasurer. The Response shall bear the seal of the corporation attested by the secretary. Anyone signing the Response as agent shall file with the Response legal evidence of his authority to do so.

7. ***Familiarity with Laws***: The bidder is assumed to be familiar with all Federal, State and local laws, ordinances, rules and regulations that in any manner affect the work. Ignorance on the part of the bidder will in no way relieve him from responsibility.

8. ***Examination of Drawings, Specifications and Site of Work***: The bidder shall visit the site of the proposed work and familiarize himself with the nature and extent of the work and all local conditions that may in any manner affect the work to be done and the equipment, materials and labor required. By submitting his bid, the bidder acknowledges that he has visited the site and that he is otherwise familiar with the nature and extent of the work and all local conditions that may in any manner affect the work to be done and the equipment, material and labor required. He is required to examine carefully the drawings and specifications and Form of Agreement and Bond and to inform himself accurately and completely regarding any and all conditions and requirements contained herein that may in any manner affect the work to be performed.

9. ***Qualifications of Bidders***: The contract(s), if awarded, will be awarded only to a responsible contractor/vendor who is qualified by experience to do/supply the work specified herein. The bidder shall submit with his Proposal evidence satisfactory to the City, of his experience in like work and when requested he shall show that he has prepared the necessary organization, capital, equipment and machinery to complete the work to the satisfaction of the City within the time limit stated in the Contract Documents.

10. ***Disqualification of Bidders***: No bidder shall submit more than one proposal, and reasonable grounds for believing that a bidder interested in more than one Proposal for the same work will cause rejection of all Proposals in which such bidder, or bidders, are believed to be interested. Any or all Proposals will be rejected if there is reason to believe that Collusion exists among the bidders and no participants in such collusion will be considered in future Proposals for the same work.

11. ***Right to Reject Submittal Response***: Right is reserved to reject any or all Proposals and to disregard technical errors.

12. ***Return of Guaranty***: As soon as the bids have been compared, the City may, at its discretion, return the guaranty deposit accompanying such Proposals as in its judgment would not likely be considered in making the award. All other proposal guaranties will be held until the Agreement and Bond have been executed, after which they will be returned to the respective bidders.

13. ***Execution of the Agreement***: The individual, firm or corporation to which the contract has been awarded shall sign the necessary Agreement with the City, and return it to the City within **ten (10)** days. No contract shall be considered binding upon the City until it has been properly executed.

14. ***Failure to Execute the Agreement***: Failure on the part of the successful bidder to execute the Agreement as required will be just cause for the annulment of the award, and in the event of the annulment of the award, the Bidder shall forfeit his bid bond. This forfeiture shall not be construed as a penalty, but as reasonable, fixed and liquidated damages because of the Bidder's failure to enter into Agreement with the City. The award may then be made to the next lowest acceptable bidder, or the work re-advertised as the City may elect.

15. ***Withdrawal of Response***: A bidder may withdraw his Proposal without prejudice to himself, not later than the day and hour set for opening of bids, by communicating his purpose in writing to the City and his Proposal will be returned to him unopened.

16. ***Interest of Member of or Delegate to Congress***. No member of or Delegate to Congress, or Resident Commissioner, shall be admitted to any share or part of this contract or any benefit that may arise therefrom, but this provision shall be construed to extend to this contract if made with a corporation for its general benefit.

17. ***Basis of Award***: Considerations will be given to price, experience of the bidder in this type of work, and their conformity with the specifications. Except where the City exercises the right reserved herein to reject any or all bids and subject to the restrictions stated hereinabove, the Contract shall be awarded by the City to the responsible Bidder who has submitted either the lowest responsive bid, or the lowest responsive bid on the base bid including such alternates/optional items as the City determines to be in its own best interests, and application of any preferences, as applicable. The quality of the material to be supplied, their suitability to requirements, and guarantee clauses shall be taken into consideration. No significant deviation for the term of this specification is acceptable. The City of Zephyrhills reserves the right to reject any or all bids as authorized by law, to accept in whole or in part any such bid, and to award the contract to other than the lowest bidder at its discretion, if the best interest of the City of Zephyrhills is thereby served.

18. ***Award of Contract***: The City reserves the right to reject any or all bids, or any part of any bid, to waive any informality in any bid, or to re-advertise for all or part of the work contemplated. The City reserves the right, prior to award of Contract, to add to the scope of the project any item or any combination of items which may exceed the total bid price for the project.

    Considerations will be given to price, experience of the bidder in this type of work, and their conformity with the specifications. Awards will be made to the lowest responsible bidder. The quality of the material to be supplied, their suitability to requirements, and guarantee clauses shall be taken into consideration. No significant deviation for the term of this specification is acceptable. The City of Zephyrhills reserves the right to reject any or all bids as authorized by law, to accept in whole or in part any such bid, and to award the contract to other than the lowest bidder at its discretion, if the best interest of the City of Zephyrhills is thereby served.

    A pre-construction meeting shall take place after the award of the contract. This meeting is mandatory pre-construction meeting. The attendees of this meeting shall be the Contractor and City Staff.

    In the event the contract is awarded to this Bidder, he will enter into a formal written agreement with the City in accordance with the accepted bid within ten (10) calendar days after said contract is submitted to him. The Bidder further agrees that in the event of the Bidder's default or breach of any of the agreements of this proposal, the said bid deposit shall be forfeited as liquidated damages.

    If awarded this contract, It is hereby understood and mutually agreed, by and between the Contractor/Vendor and the Owner, that the date of beginning and the time for completion as specified

in the contract of the work to be done hereunder are ESSENTIAL CONDITIONS of this contract; and it is further mutually understood and agreed that the work embraced in this contract shall be commenced on a date to be specified in the "Notice to Proceed."

It is further agreed where under the contract an additional time is allowed for the completion of any work, the time limit fixed by such extension shall be of the essence of this contract. Provided, that the Contractor/Vendor shall not be charged with liquidated damages or any excess cost when the Owner determines that the Contractor/Vendor is without fault and the Contractor's or Vendor's reason for the time extension is acceptable to the Owner: Provided, further, that the Contractor/Vendor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

(a) To any preference, priority or allocation order duly issued by the Government.
(b) To any delays of Subcontractors or suppliers occasioned by any of the causes specified in subsection (a).

Provided, further, that the Contractor/Vendor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor/Vendor within a reasonable time of its decision in the matter.

The Contractor/Vendor agrees that said work shall be prosecuted regularly, diligently, and uninterrupted at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor/Vendor and the Owner, that the time for the completion of the work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality. The Bidder agrees to supply all materials within thirty (30) days after successful agreement has been signed by both parties and after contract has been submitted to them and receipt of Notice to Proceed.

If the said Contractor/Vendor shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the Owner, then the Contractor/Vendor does hereby agree, as a part consideration for the awarding of this contract, to pay to the Owner the amount

specified in the contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contractor/Vendor shall be in default after the time stipulated in the contract for completing the work

Should the contractor/vendor fail to substantially complete and supply the materials listed under this contract and make it available for beneficial use on or before the date stipulated for completion (or such later date as may result from extension of time granted by City), he shall pay the City, as liquidated damages, the sum of **$1000.00** for each consecutive calendar day that terms of the contract remain unfulfilled beyond date allowed by the contract, which sum is agreed upon as a reasonable and proper measure of damages which City will sustain per diem by failure of Contractor/vendor to supply the materials within the time stipulated; it being recognized by City and Contractor/vendor that the injury to City which could result from a failure of Contractor/vendor to complete on schedule is uncertain and cannot be computed exactly. In no way shall costs for liquidated damages be construed as a penalty.

Any notice to any Contractor/Vendor from the Owner relative to any part of this contract shall be in writing and considered delivered and the service thereof completed, when said notice is posted, by

certified or registered mail, to the said Contractor/Vendor at his last given address or delivered in person to the said Contractor/Vendor or his authorized representative on the work.

19. ***Conditions***: The bidder shall list on a separate sheet of paper any variations from, or exceptions to, the conditions and specifications of this bid. This sheet shall be labeled "Exceptions to Bid Conditions and Specifications", and shall be attached to the bid. Any variations or exceptions shall meet or exceed the plans and specifications.

20. ***Quantities***: An estimate of the quantities of work to be done and/or materials to be furnished is given in the specifications. It is the result of the City's calculations and is believed to be correct. It is given only as a basis of comparison of bids and the City does not expressly or by implication agree that the actual quantities involved will correspond exactly therewith; nor shall the bidder plead misunderstanding or deception because of such estimates of quantities, or of the character, location, or other conditions pertaining to the work performed or materials furnished in accordance with the plans and specifications. It is understood that the quantities may be increased or decreased without in any way invalidating the unit bid prices.

21. ***Public Records***: In accordance with 119.0701 F.S. Contractor shall:

IF CONSULTANT OR CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONSULTANT'S OR CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT OR CONTRACT, THEY SHALL CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT:

LORI HILLMAN, CITY CLERK
CITY OF ZEPHYRHILLS
5335 8TH STREETH
ZEPHYRHILLS, FLORIDA 33542
LHILLMAN@CI.ZEPHYRHILLS.FL.US
813-780-0000

22. ***Correction of Work***. All work, all materials, whether incorporated in the work or not, all processes of manufacture, and all methods of construction shall be at all times and places subject to the inspection of the Architect/Engineer who shall be the final judge of the quality and suitability of the work, materials, processes of manufacture, and methods of construction for the purposes for which they are used. Should they fail to meet his approval they shall be forthwith reconstructed, made good replaced and/or corrected, as the case may be by the Contractor/Vendor at his own expense. Rejected materials shall immediately be removed from the site. If, in the opinion of the Architect/Engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor/Vendor hereunder shall be reduced by such amount as in the judgment of the Architect/Engineer shall be equitable.

23. ***Subsurface Conditions Found Different***. Should the Contractor/Vendor encounter sub-surface and/or latent conditions at the site materially differing from those shown on the Plans or indicated in the Specifications, the Contractor/Vendor shall immediately give notice to the Architect/Engineer of such conditions before they are disturbed. The Architect/Engineer will thereupon promptly investigate the conditions, and if he finds that they materially differ from those shown on the Plans

or indicated in the specifications he will at once make such changes in the Plans and/or Specifications as the Contractor/Vendor may find necessary, any increase or decrease of cost resulting from such changes to be adjusted in the manner provided in Paragraph 17 of the General Conditions.

24. ***Claims for Extra Cost.*** No claim for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Architect/Engineer approved by the Owner, as aforesaid, and the claim presented with the first estimate after the changed or extra work is done. When work is performed under the terms of subparagraph 17 of the General Conditions, the Contractor/Vendor shall furnish satisfactory bills, payrolls, and vouchers covering all items of cost and when requested by the Owner, give the Owner access to accounts relating thereto.

25. ***Termination (Cause and/or Convenience).***

a. This contract may be terminated in whole or in part in writing by either party in the event of substantial failure by the other party to fulfill its obligations under this contract through no fault of the terminating party, provided that no termination may be effected unless the other party is given (1) not less than ten (10) calendar days written notice (delivered by certified mail, return receipt requested) of intent to terminate and (2) an opportunity for consultation with the terminating party prior to termination.

b. This contract may be terminated in whole or in part in writing by the local government for its convenience, provided that the other party is afforded the same notice and consultation opportunity specified in 1(a) above.

c. If termination for default is effected by the local government, an equitable adjustment in the price for this contract shall be made, but (1) no amount shall be allowed for anticipated profit on unperformed services or other work, and (2) any payment due to the contractor/vendor at the time of termination may be adjusted to cover any additional costs to the local government because of the contractor's or vendor's default.

If termination for convenience is affected by the local government, the equitable adjustment shall include a reasonable profit for services or other work performed for which profit has not already been included in an invoice.

For any termination, the equitable adjustment shall provide for payment to the contractor/vendor for services rendered and expenses incurred prior to receipt of the notice of intent to terminate, by the contractor/vendor relating to commitments (e.g., suppliers, subcontractors) which had become firm prior to receipt of the notice of intent to terminate.

d. Upon receipt of a termination action under paragraphs (a) or (b) above, the contractor/vendor shall (1) promptly discontinue all affected work (unless the notice directs otherwise) and (2) deliver or otherwise make available to the local government all data, drawings, reports specifications, summaries and other such information, as may have been accumulated by the contractor/vendor in performing this contract, whether completed or in process.

e. Upon termination, the local government may take over the work and may award another party a contract to complete the work described in this contract.

f. If, after termination for failure of the contractor/vendor to fulfill contractual obligations, it is determined that the contractor/vendor had not failed to fulfill contractual obligations, the termination shall be deemed to have been for the convenience of the local government. In such event, adjustment of the contract price shall be made as provided in paragraph (c) above.

PRELIMINARY MATTERS

Delivery of Bonds: Simultaneously with the execution and delivery of the Agreement, the Contractor/Vendor shall deliver to the City the required executed Bonds. Additional copies will be furnished, upon request, at the cost of reproduction.

Before Starting Work: Before starting the work at the site, the Contractor/Vendor shall furnish the City with certificates of insurance and schedules as required by the City and a conference will be held to review the above schedules, to establish procedures for handling Applications for Payment and to establish a working understanding between the parties as to the Project. Present at the conference will be the City and its representative, the Contractor/Vendor and his Superintendent.

The Contractor/Vendor shall furnish a list of key personnel within **fifteen (15)** calendar days of starting construction. This list should include the superintendent, all personnel at the site and their assignments, name, title, telephone numbers (work and cellular) along with email addresses.

Before undertaking the Work, the Contractor/Vendor shall carefully study and compare the Contract Documents and check and verify all figures shown thereon and all field measurements. He shall at once report in writing to the City any conflict, error or discrepancy which he may discover. The Contractor/Vendor assumes full responsibility for having familiarized himself with the nature and extent of the Contract Documents, Work, locality and local conditions that may in any manner affect the Work to be done and represents that he has visited the site.

The City shall give the Contractor/Vendor a written Notice to Proceed, stating a date on which it is expected that the Contractor/Vendor will start the work. No work shall be done prior to the date on which the Work is to start.

The Contractor/Vendor Time shall commence to run on the date of the Notice to Proceed.

CORRELATION, INTERPRETATION, AND INTENT OF CONTRACT DOCUMENTS

For Construction: It is the intent of the Specifications and Drawings to describe a complete Project to be constructed in accordance with the Contract Documents. The Contract Documents comprise the entire Agreement between the City and the Contractor/Vendor. They may be altered only by a Modification. The Contract Documents cover, with explicit provisions, all matters relating to the work which the Contractor/Vendor undertakes to construct or perform in full compliance with such provisions. It is understood that the Contractor/Vendor has, by personal examination and inquiry, if necessary, satisfied himself as to all local conditions and as to the meaning, requirements and reservations of the Contract Documents. No deviation will be allowed from the City's interpretation thereof. The intent of the Contract Documents is to include all labor, materials, equipment, and transportation necessary for the proper execution of the work. The Contractor/Vendor shall make plural and complete all work which, to

avoid needless repetition or for the sake of brevity, has been shown singly or partially indicated. The Contractor/Vendor shall follow the Drawings and execute all work in strict accordance therewith and with the kind and quality of materials indicated and specified. Materials or work described in words which, when so applied, have a well-known technical or trade meaning shall be held to refer to such recognized standards. Any deviation from Specifications, which may be required by the exigencies of construction, shall in all cases conform to written instructions of the City. The applicable provisions of the Contract Documents shall apply with equal force to all work, including extra work, performed under this Contract, whether performed either directly by the Contractor/Vendor or by any Subcontractor.

The Contract Documents are complementary; what is called for by one is as binding as if called for by all. If the Contractor/Vendor finds a conflict, error or discrepancy in the Contract Documents, he shall call it to the City's attention in writing before proceeding with the Work affected thereby. In resolving such conflicts, errors and discrepancies, the documents shall be given precedence in the following order: Agreement, Special Conditions, General Conditions, Specifications, including any Addenda, Drawings,

Invitation to Bid and Contractors/Vendors Bid. Any work that may reasonably be inferred from the Specifications or Drawings as being required to produce the intended result shall be supplied whether or not it is specifically called for. Work, materials or equipment described in words which so applied have a well-known technical or trade meaning shall be deemed to refer to such recognized standards.

Insurance: Contractor/vendor shall, at its sole cost and expense, procure and maintain throughout the term of the contract, Comprehensive General Liability and Worker's Compensation insurance, including Employer Liability insurance, with minimum policy limits of $1,000,000 (this could be $2,000,000 depending on the amount of the contract) combined Single Limits, or to the extent and in such amounts as required and authorized by Florida law, and will provide endorsed certificates of insurance generated and executed by a licensed insurance broker, brokerage or similar licensed insurance professional evidencing such coverage, and naming the City of Zephyrhills as a named, additional insured, as well as furnishing the City of Zephyrhills with a certified copy, or copies, of said insurance policies. Certificates of insurance and certified copies of these insurance policies must accompany the signed contract. Said insurance coverages procured by the contractor/vendor as required herein shall be considered, and the contractor/vendor agrees that said insurance coverages it procures as required herein shall be considered, as primary insurance over and above any other insurance, or self-insurance, available to the City of Zephyrhills, and that any other insurance, or self-insurance available to the City of Zephyrhills shall be considered secondary to, or in excess of, the insurance coverage(s) procured by the contractor/vendor as required.

Nothing shall be construed to extend the City of Zephyrhills's liability beyond that provided in section 768.28, Florida Statutes.

Builders' Risk Coverage: ***For any contracts that may apply to the following in the first sentence should also include statement below.*** If this solicitation includes: (1) construction of a new above-ground structure or structures, or (2) any addition(s), improvement(s), alteration(s), or repair(s), to an existing above-ground structure or structures, or (3) the installation of machinery or equipment into an existing structure or structures, the Contractor shall provide, in a policy acceptable to the City, "all risk" (i.e., Special Form) property insurance on any such construction, additions, machinery or equipment. The amount of the insurance shall be no less than the estimated replacement value at the time of the City's final acceptance of such new structures, addition(s), improvement(s), alternation(s), repair(s), machinery or equipment. The coverage shall not be subject to any restriction with respect to occupancy or use by the City and, subject to thirty (30) days' prior written notice to the City shall remain in full effect until final acceptance by the City. In addition, the City, the Professional, and the Contractor's subcontractors of any tier, shall be additional insureds on this policy. The insurance shall include a deductible no greater than one percent (1%) of the Contract amount, or $25,000, whichever is smaller, for which the Contractor

shall be responsible. The risk of loss whether insured or not shall remain with the Contractor until final acceptance. Upon request, Contractor shall furnish to the City complete copies of the insurance policy.

Liens: The Contractor/vendor shall indemnify and save harmless the City from all claims, demands, causes of action, suits of whatever nature arising out of the services, labor, and materials furnished by the Contractor/Vendor or its Subcontractors under this Contract, and from all laborers', materialmen's and mechanics' liens upon the property which the work is located arising out of the services, labor, and materials furnished by the Contractor/Vendor or any of its Subcontractors under this Contract; and shall keep said property free and clear of all liens, claims, and encumbrances arising from the performance of this Contract by the Contractor/Vendor or its Subcontractors; the Contractor/Vendor hereby waiving all rights to claim such lien on the City's properties.

If required, the Contractor/Vendor shall furnish at the City's option either (a) a good and sufficient release or waiver of lien from itself, every subcontractor, materialman, laborer, and other person furnishing services, labor, or materials in connection with the work or (b) receipts in full, together with an affidavit that the receipts cover all the services, labor, and materials furnished by the Contractor/Vendor or its Subcontractors for which a lien might be filed except as covered by the releases and waivers of liens; but if any Subcontractor, laborer, materialman, or other person refuses to furnish a waiver or release a receipt in full, the Contractor/Vendor may furnish a Bond satisfactory to the City to indemnify the City against any claim or lien or otherwise. (c) Surety Bond may be furnished by the Contractor/Vendor or his Surety as a guarantee that he will execute the work in accordance with the terms of the Contract, and that he shall make all payments for all labor, materials and supplies directly or indirectly for the work. If Surety Bond is required by the City, Contract price will be increased by an amount equal to the cost of securing said Bond.

Definitions: The following terms are respectively defined as follows:

- Contractor/Vendor: A person, firm or corporation with whom the contract is made by the Owner/City.
- Subcontractor: A person, firm or corporation supplying labor and materials or only labor for at the site of the project for, and under separate contract or agreement with the Contractor/Vendor.
- Work on (at) the Project: Work to be performed at the location of the project, including the transportation of materials and supplies to or from the location of the project by employees of the Contractor and any subcontractor.
- Owner: Can represent the City of Zephyrhills and/or property/business owners.

CONTRACTOR'S or VENDOR's RESPONSIBILITIES

Supervision and Superintendence: The Contractor/Vendor shall supervise and direct the Work efficiently and with his best skill and attention. He shall be solely responsible for the means, methods, techniques, sequences and procedures of construction. The Contractor/Vendor shall be responsible to see that the finished Work complies accurately with the Contract Documents. The Contractor/Vendor shall accept full responsibility for the work until final acceptance. He shall protect the work against all loss or damage sustained during the progress of the work and promptly repair any damage done from any cause whatsoever. After acceptance of the work, Contractor's or Vendor's responsibility shall extend to defective or faulty work as later defined in these specifications.

The Contractor/Vendor shall keep on the Work site at all times during its progress, a competent resident superintendent who shall not be replaced without written consent of the City, under extraordinary circumstances. The Superintendent will be the Contractor's or Vendor's representative at the Site and

shall have the authority to act on behalf of the Contractor/Vendor. He shall be present at the pre-construction conference. All communications given to the Superintendent shall be as binding as if given to the Contractor/Vendor.

Labor, Materials, Equipment, and Manufactured Articles: The Contractor/Vendor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. He shall at all times maintain good discipline and order at the site.

The Contractor/Vendor shall furnish all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water and sanitary facilities, and all other facilities and incidentals necessary for the execution, testing, and initial operation and completion of the Work. Any work necessary to be performed after regular working hours, on Sunday or legal holiday, shall be performed without additional expense to the City.

All materials and equipment shall be new, except as otherwise provided in the Contract Documents. If required by the City, the Contractor/Vendor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. All material and workmanship shall in every respect, be in accordance with what, in the opinion of the City, is in conformity with approved modern practice.

Contractor's or Vendor's Title to Materials: No materials or supplies for the work shall be purchased by the Contractor/Vendor or by any Subcontractor subject to any chattel mortgage or under a conditional sale contractor/vendor or other agreement by which an interest is retained by the seller. The Contractor/Vendor warrants that he has good title to all materials and supplies used by him in the work, free from all liens, claims or encumbrances.

Request for Information (RFI): Immediately on discovery of the need for additional information the Contractor/Vendor shall submit a RFI to the Owner's representative, Project Manager.

Use of Premises: The Contractor/Vendor shall confine his equipment, the storage of materials and equipment and the operations of his workmen to areas permitted by law, ordinances, or permits and shall not unreasonably encumber the premises with materials or equipment. Materials stored without proper permits shall be promptly relocated upon request by the City at the Contractor's or Vendor's expense.

Record Drawings: The Contractor/Vendor shall keep one record copy of all Specifications, As-built Drawings, Addenda, Modifications and Shop Drawings at the site in good order and annotated to show all changes made during the construction process. These shall be available to the RPR and the Engineer. As-builts shall be delivered to them for the City and Engineer upon completion of the Project. Release of retainage shall be contingent upon delivery of red-lined "as-builts".

Supplementary Drawings: When, in the opinion of the City, it becomes necessary to explain more fully the work to be done, or to illustrate the work further, or to show any changes which may be required, drawings, known as supplementary drawings, with specifications pertaining thereto, will be prepared by the Engineer.

The additional drawings and instructions supplied to the Contractor/Vendor will coordinate with the Contract Documents and will be prepared that they can be reasonably interpreted. The Contractor/Vendor shall carry out the work in accordance with the additional detail drawings and instructions. The Contractor/Vendor and the Architect/Engineer will prepare jointly: (a) a schedule, fixing the dates at which special detail drawings will be required, such drawings, if any, to be furnished by the Architect/Engineer in accordance with said schedule, and (b) a schedule fixing the respective dates for the submission of shop drawings; the beginning of manufacture, testing and installation of materials, supplies and equipment; and the completion of the various parts of the work; each such schedule to be

subject to change from time to time in accordance with the progress of the work The supplementary drawings shall be binding upon the Contractor/Vendor with the same force as the drawings. Where such supplementary drawings require either less or more than the estimated quantities of work, credit to the City or compensations therefore to the Contractor/Vendor shall be subject to the terms of the agreement.

Shop or Setting Drawings: The Contractor/Vendor shall submit promptly to the Architect/Engineer four (4) copies of each shop or setting drawing prepared in accordance with the schedule predetermined as aforesaid. After examination of such drawings by the Architect/Engineer and the return thereof, the Contractor/Vendor shall make such corrections to the drawings as have been indicated and shall furnish the Architect/Engineer with four (4) corrected copies. If requested by the Architect/Engineer the Contractor/Vendor must furnish additional copies. Regardless of corrections made in or approval given to such drawings by the Architect/Engineer, the Contractor/Vendor will nevertheless be responsible for the accuracy of such drawings and for their conformity to the Plans and Specifications, unless he notifies the Architect/Engineer in writing of any deviations at the time he furnishes such drawings.

Architect/Engineer's Authority: The Architect/Engineer shall give all orders and direction contemplated under the contract and specifications, relative to the execution of the work. The Architect/Engineer shall determine the amount, quality, acceptability, and fitness of the several kinds of work and materials that are to be paid for under this contract and shall decide all questions which may arise in relation to said work and the construction thereof. The Architect/Engineer's estimates and decisions shall be final and conclusive, except as herein otherwise expressly provided. In case any question shall arise between the parties hereto relative to said contract or specifications; the determination or decision of the Architect/Engineer shall be a condition precedent to the Contractors/Vendors to receive any money or payment for work under this contract affected in any manner or to any extent by such question.

The Architect/Engineer shall decide the meaning and intent of any portion of the specifications and of any plans or drawings where the same may be found obscure or be in dispute. Any differences or conflicts in regard to their work that may arise between the contractor/vendor under this contract and other Contractors/Vendors performing work for the City shall be adjusted and determined by the Architect/Engineer.

Safety and Protection: The Contractor/Vendor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. He shall take all necessary precautions for the safety of and shall provide the necessary protection to prevent damage, injury or loss to:

All employees on the Work and other persons who may be affected thereby.

All the Work and all materials or equipment to be incorporated therein, whether in storage on or off the site.

Other property, including City property, at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction. The Contractor/Vendor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in the contract or by the City, or his duly authorized representatives. He shall notify the Architect/Engineer immediately. Any claim for compensation by the Contractor/Vendor shall be promptly submitted to the Architect/Engineer for approval.

The Contractor/Vendor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's Superintendent unless otherwise designated in writing by the Contractor/Vendor to the City.

SAFETY PLAN

A. It is the contractor's or vendor's responsibility to comply with OSHA standards and all regulations pertaining to the work including confined space entry.

B. Precaution shall be exercised at all times for the protection of persons and property. The safety provisions of applicable laws, and existing building and construction codes shall be guarded in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractor of America, and OSHA's Safety and Health Standards (29 CFR 1926/1910) U.S. Department of Labor, to the extent that such provisions are not in contravention of applicable law.

C. ***Safety Requirements***:

1. The Contractor/Vendor shall provide documentation on Means of Egress, Emergency Evacuation, Confined Space Entry, Lock Out – Tag Out, Hot Work Permit, Hurricane Preparedness, Right-to-Know / MSDS Sheets to the satisfaction of the City prior to commencement of any single job.
2. A Contractor/Vendor Process Safety Management Briefing will be held at the Pre-Construction Conference. The Contractor/Vendor will be required to attend this briefing and sign a form so stating that he has been briefed. A copy of this form is included in the Forms section of this package.

Trench Safety Act: Each contractor must submit with his bid an executed sworn certification that he will comply with the Trench Safety Act, Chapter 90-96, Florida Statues, on trench safety.

Emergencies: In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor/Vendor, without special instruction or authorization from the City, is obligated to act, at his discretion, to prevent threatened damage, injury or loss.

Assignability. The Contractor/Vendor shall not assign the whole or any part of this contract or any monies due or to become due hereunder without written consent of the Owner. In case the Contractor/Vendor assigns all of any part of any monies due or to become due under this contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that right of the assignee in and to any monies due or to become due to the Contractor/Vendor shall be subject to prior claims of all persons, firms and corporations of services rendered or materials supplied for the performance of the work called for in this contract.

Mutual Responsibility of Contractors/Vendors. If, through acts of neglect on the part of the Contractor/Vendor, any other Contractor/Vendor or any subcontractor shall suffer loss or damage on the work, the Contractor/Vendor agrees to settle with such other Contractor/Vendor or subcontractor by agreement or arbitration if such other Contractor/Vendor or subcontractor will so settle. If such other Contractor/Vendor or subcontractor shall assert any claim against the Owner or account of any damage alleged to have been sustained, the Owner shall notify the contractor/vendor, who shall indemnify and save harmless the Owner against any such claim.

Subcontractors: The Contractor/Vendor shall not employ any Subcontractor against whom the City may have reasonable objection, nor will the Contractor/Vendor be required to employ any Subcontractor against whom he has reasonable objection. Within 30 calendar days after the date of the Award of

Contract and before the City shall make any partial payments to the Contractor/Vendor, the Contractor/Vendor shall furnish to the City in writing for acceptance by the City a list of the names of the Subcontractors proposed for the principal portions of the work. The Contractor/Vendor shall not make any substitution for any Subcontractor who has been accepted by the City, unless the City determines that there is good cause for doing so.

The Contractor/Vendor shall be fully responsible for all acts and omissions of his Subcontractors and of persons directly or indirectly employed by them and of persons for whose acts any of them may be liable to the same extent that he is responsible for the acts and omissions of persons directly employed by him. Nothing in the Contract Documents shall create any contractual relationship between any Subcontractor and the City or any obligation on the part of the City to pay or to see to the obligation on the part of the City to pay or to see to the payment of any moneys due any Subcontractor, except as may otherwise be required by law. The City may furnish to any Subcontractor, to the extent practicable, evidence of amounts paid to the Contractor/Vendor on account of specific work done in accordance with schedule of values.

The divisions and sections of the Specifications and the identifications of any Drawings shall not control the Contractor/Vendor in dividing the work among Subcontractors or delineating the work to be performed by any specific trade.

The Contractor/Vendor agrees to bind specifically every Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of the City. The terms of the Contract Documents shall control over any discrepancy in any other document.

Laws and Regulations: The Contractor/Vendor shall give all notices and comply with all laws, ordinances, rules and regulations applicable to the work. If the Contractor/Vendor observes that the Specifications or drawings are at variance therewith, he shall give the City prompt written notice thereof, and any necessary changes shall be adjusted by an appropriate Modification. If the Contractor/Vendor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations and without such notice to the Engineer, he shall bear all costs arising therefrom; however, it will not be his primary responsibility to make certain that the drawings and Specifications are in accordance with such laws, ordinances, rules and regulations.

Permits and Protection of Public: The Contractor/Vendor shall be required to observe all the ordinances in relation to obtaining permits for occupying, excavating or in anywise obstructing the streets and alleys. He shall erect and maintain barricades and sufficient safeguards around all excavations, embankments or obstructions.

Where there are telephone, telegraph, light or power poles; water mains, conduits, pipe, or drains; or other construction either public or private; in or on the streets or alleys; the work shall be so conducted that no interruption or delay will be caused in the operation or use of the same. Proper written notice shall be given and all the facilities afforded the owners of such construction encountered or likely to be encountered, as will enable them to preserve the same from injury.

Unless otherwise expressly provided for in the Specifications, the City will furnish to the Contractor/vendor all surveys necessary for the execution of the work.

The Contractor/Vendor shall procure and pay all other permits, licenses and approvals necessary for the execution of this contract and shall comply with all Florida Department of Environmental Protection requirements. Cost of building permits will be paid by the contractor. ***The selected Contractor/Vendor must be registered with the City of Zephyrhills Building Department before starting the project.***

Use of Premises: The Contractor/Vendor shall confine his equipment, the storage of materials and equipment and the operations of his workmen to areas permitted by law, ordinances, or permits and shall not unreasonably encumber the premises with materials or equipment. Materials stored without proper permits shall be promptly relocated upon request by the City at the Contractor's or Vendor's expense.

Quality Control: The Contractor/Vendor shall maintain quality control over suppliers, manufacturers, products, services, site-conditions, and workmanship to assure they meet or exceed requirements of Standard and local building codes.

Cleaning: The Contractor/Vendor shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the work. The Contractor shall clean up work site, interior and exterior of building, any and all equipment or fixtures must operate properly and not show any signs of damage or any defects. At the completion of the work he shall remove all waste materials, rubbish, and debris from and about the premises as well as all tools, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by the City. The Contractor/Vendor shall restore to their original condition those portions of the site for alteration by the Contract Documents.

Protection of Work and Materials: Facilities for handling of material and inspecting the work shall at all times be furnished by the Contractor/Vendor, and all costs due to delays in handling of materials or equipment, and loss or damage, shall be at the expense of the Contractor/Vendor. The Contractor/Vendor shall be responsible for all materials, equipment and supplies sold and delivered to

the City until final inspection of the work and acceptance thereof by the City. In the event any such materials, equipment and supplies are lost, stolen, damaged or destroyed prior to receipt of delivery, Contractor/Vendor shall replace same without cost to the City.

Lands and Right-of-Way: Prior to the start of construction, the City shall obtain all lands and right-of-way necessary for the carrying out and completion of work to be performed under this contract.

Other Prohibited Interests: No official of the City who is authorized in such capacity and on behalf of the City to negotiate; make, accept or approve or to take part in negotiating, making, accepting or approving any architectural, engineering, inspection, construction or material supply contract or any subcontracting connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part hereof. No official who is authorized in such capacity and on behalf of the City to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material supply contract, insurance contract, or any other contract pertaining to the project.

Construction Schedule and Periodic Estimates: Immediately after execution and delivery of the contract, and before the first partial payment is made, the Contractor/Vendor shall deliver to the City an estimated construction progress schedule in a form satisfactory to the City, showing the proposed dates of commencement and completion of each of the various subdivision of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due to the Contractor/Vendor in accordance with the progress schedule. The Contractor/Vendor shall also furnish on forms mutually agreeable to the Engineer, Contractor/Vendor and the City: (a) a detailed estimate giving a complete breakdown of the contract price, and (b) periodic itemized estimates of work done for the purpose of making partial payments therefore. The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

Payments to Contractor/Vendor. (a) At the end of each calendar month during the life of the contract, the contractor/vendor will prepare an estimate of the quantities of the work completed and of the total amount due. The amount will be due on or before the 15th day of the second month following the completion of said work. (b) In preparation of monthly partial pay, estimated accounts may be taken if specifically approved by the owner of materials delivered to the site of work but not yet incorporated into the work. (c) When the work provided for by the contract has been completely performed on the part of the contractor/vendor and all parts of the work have been approved by the engineer and accepted by the owner, a final estimate will be prepared which shows the total cost of the work performed under the contract, including extra work as authorized by change orders, the total amount retained, and the total amount paid on previous partial estimates. All prior estimates upon which payments have been made are subject to necessary corrections or revisions in the final payment. All pay estimates will be reviewed for correctness by the engineer and approved by the owner before payment. NOTE: All payments will be processed by ACH/EFT processing and the contractor will need to be enrolled.

Payments by Contractor/Vendor. The Contractor/Vendor shall pay: (a) for all transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered; and (b) for all materials, tools, and other expendable equipment to the extent of ninety percent (90%) of the cost thereof, not later than the 20th day of the calendar month following that in which such materials, tools, and equipment are delivered at the site of the project, and the balance of the cost thereof, not later than the 30th day following the completion of that part of the work in or on which such materials, tools and equipment are incorporated or used; (c) to each of his subcontractors, not later than the 5th day

following each payment to the Contractor/Vendor, the respective amounts allowed the Contractor/Vendor on account of the work performed by his subcontractors to the extent of each subcontractor's interest.

Acceptance of Final Payment Constitutes Release: The acceptance by the Contractor/Vendor of final payment shall be and shall operate as a release to the City of all claims and all liability to the Contractor/Vendor for all things done or furnished in connection with this work and for every act and neglect of the City and others relating to or arising out of this work. No payment, however, final or otherwise, shall operate to release the Contractor/Vendor or his sureties from any obligations under this contract or the Performance and Payment Bond.

Decisions in Disagreements: The Engineer will be the interpreter of the terms and conditions of the Contract Documents and the judge of the performance thereunder. In his capacity as interpreter and judge, he will exercise his best efforts to ensure faithful performance by both the City and the Contractor/Vendor. He will not show partiality to either and shall not be liable for the result of any interpretation or decision rendered in good faith. Claims, disputes and other matters relating to the execution and progress of the work or the interpretation of or performance under the Contract Documents shall be referred to the Engineer for decision; which he will render in writing within a reasonable time.

Change Orders: Without invalidating the Agreement, the City may, at any time or from time to time, order additions, deletions, or revisions in the work authorized by an executed, signed Change Order. Change Orders should be submitted on an **AIA Document G701** *(exampled attached in the Forms section of this package)*. Change Orders is a defined written instrument prepared by the Contractor and signed by both Contractor and authorized City representative.

Upon receipt of an executed authorized Change Order, the Contractor/Vendor shall proceed with the work involved. All such work shall be executed under the applicable conditions of the Contract Documents. If any Change Order causes an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment will be made.

The RPR may authorize changes or alterations in the work not involving extra cost and not inconsistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order. If the Contractor/Vendor believes that any minor change or alteration authorized by the RPR entitled him to an increase in the Contract Price, he may make a claim in writing.

The Contractor/Vendor shall not start work on any alteration requiring an increase or decrease in price or extension of time until a Change Order setting forth the adjustments is executed by the City.

It is the Contractor's or Vendor's responsibility to notify his Surety of any changes affecting the general scope of the work or change in the Contract Price and the amount of the applicable Bonds shall be adjusted accordingly. The Contractor/Vendor shall furnish proof of such adjustment to the City.

Change of Contract Time: The Contract Time may only be changed by a Change Order. Any claim for an extension in the Contract Time, shall be in writing delivered to the City within five days of the occurrence of the event giving rise to the claim. All claims for adjustment in the Contract Time shall be determined by the Engineer if the City and the Contractor/Vendor cannot otherwise agree. Any change in the Contract Time resulting from any such claim shall be incorporated in a Change Order.

The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of the Contractor if he makes a claim therefore as provided for. Such delays shall include, but not be restricted to, acts or neglect by any separate Contractor/Vendor employed by the City, fires, floods, labor disputes, epidemics, abnormal weather conditions, or acts of God.

All time limits stated in the Contract Documents are of the essence of the Agreement.

Whenever changes in the work are ordered by written Modification, the extension to the Contract Time, if an extension is to be allowed, shall be noted in the same written Modification.

Claims for extension of Contract Time will be approved only if the work or the event which causes the delay, affects the path of critical events of the project. In such case an extension of time will then be allowed only to equal the number of days by which this path of events is lengthened. If required by the Engineer, Contractor/Vendor shall indicate this path of critical events, by diagram or narrative, in such detail as may be necessary to justify his claim and establish the number of days' delay. The path of critical events mentioned herein is defined as that series of interdependent construction events which must be sequentially performed and which require a longer total time to perform than any other such series. Said extension shall be, as determined by the Engineer, sufficient to compensate for the detention, provided it shall have immediate notice from the Contractor/Vendor, in writing, of the cause and the probable length of the detention; however, neither an extension of any time for any reason beyond the date set herein, nor the acceptance of any work subsequent to said date, shall be deemed a waiver by the City of the right to abrogate the Contract for delay.

Weather Conditions: In the event of temporary suspension of work, or during inclement weather or whenever the Architect/Engineer shall direct, the Contractor/Vendor will and will cause his subcontractors to carefully protect his and their work and materials against damage or inquiry from the weather. If, in the opinion of the Architect/Engineer, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor/Vendor or any of his Subcontractors to protect this work, such materials shall be removed and replaced at the expense of the Contractor/Vendor.

Photographs of the Project. *If required by the Owner, the Contractor/Vendor shall furnish photographs of the project, in the quantities* as requested.

Tests and Inspections: All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Owner. The offer or payment of any compensation, whatever may be its character or form, the offer or giving of any gratuity, or the offer or granting of any valuable favor by the Contractor/Vendor to any Inspection, directly or indirectly, is strictly prohibited, and any such act on the part of the Contractor/Vendor will constitute a violation of this Contract.

If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any work to specifically be inspected, tested, or approved by someone other than the Contractor/Vendor, the Contractor/Vendor shall give the City notice of readiness therefore. The Contractor/Vendor shall furnish the City the required certificates of inspection, testing or approval. All such tests shall be in accordance with the methods prescribed by the American Society for Testing and Materials or such other applicable organization as may be required by law or the Contract Documents. If any such work required so to be inspected, tested or approved is covered without approval of the City, it shall be requested by the City, be uncovered for observation at the Contractor's or Vendor's expense. The cost of such inspections, tests, and approvals shall be borne by the Contractor/Vendor unless otherwise provided.

The City of Zephyrhills shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

Use and Occupancy Prior to Acceptance by City: The Contractor/Vendor agrees to the use and occupancy of a portion or unit of the project before formal acceptance by the City, provided the City:

A. Secures written consent of the Contractor/Vendor except in the event, in the opinion of the Architect/Engineer, the Contractor/Vendor is chargeable with unwarranted delay in final cleanup or punch list items or other contract requirements.
B. Secures endorsement from the insurance-carrier and consent of the Surety permitting occupancy of the building or use of the project during the remaining period of construction.

Acceptance: Upon completion, the project manager shall inspect the project to assure all quality control standards are in compliance with the plans and specifications contained herein. The contract retainage ten (10%) will be released for final payment upon completion of all punch list items.

Guarantee and Warranties: Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the City, shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor/Vendor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The

Contractor/Vendor shall remedy any defect in the work and pay for any damage to other work resulting there from, which shall appear within a period of one (1) year from the date of final acceptance of the work unless a longer period is specified. The City will give notice of observed defects with reasonable promptness.

All guarantees and warranties shall commence on the date of substantial completion or on acceptance by the owner of re-work items. The Contractor shall furnish a one (1) year unconditional warranty. The

warranty shall include all manufacturers' warranties on equipment and material installed by the Contractor or any subcontractors. These items shall be transferred to the City and in the City's name. All warranty items shall be secured in an organized 3-ring binder.

City May Stop the Work: If the work is defective, or the Contractor/Vendor fails to supply sufficient skilled workmen or suitable materials or equipment or if the Contractor/Vendor fails to make prompt payments to Subcontractors for labor, materials, or equipment, the City may order the Contractor/Vendor to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the City to stop the work shall not give rise to any duty on the part of the City to exercise this right for the benefit of the Contractor/Vendor or any other party.

For each consecutive calendar day that the work remains incomplete after the date established for final completion, the Contractor/Vendor shall pay City and the City is authorized to retain from the compensation otherwise to be paid to the Contractor/Vendor the sum of the phase schedule, **$1000.00.** This amount is the minimum measure of damages the City will sustain by failure of the Contractor to complete all remedial work, correct deficient work, clean up the project and other miscellaneous tasks as required to complete all work specified. This amount is in addition to the liquidated damages prescribed above, and likewise shall not be construed as a penalty.

The Bidder hereby agrees that the City reserves the right to waive any bid and to reject any or all bids, or to accept any bid that in its judgment will be in the best interest of the City. The bidder's signature understands and acknowledges the requirements set forth in this bid package.

_____ _____

Signature/Print Name/Company Date

In witness whereof, the Bidder has hereunto set his signature and affixed his seal this_____day of_____A.D. 2024

_____ (Seal) By: _____

Title: _____

Scope of Work: The City of Zephyrhills is seeking a contractor to construct a force main and water main along south side of the City. The project will install approximately 6,000 LF of 6-inch PVC force main along the west side of Gall Boulevard beginning at C Ave and turning east on Tucker Road and terminating west of the railroad tracks. Approximately 4,600 LF of the force main will be installed using horizontal directional drilling; the remainder will be installed using open-cut methods. The force main will connect to an existing 6-inch force main on Tucker Road and no new residential, commercial, or industrial services will be constructed.

Additionally, the project will install approximately 3,000 LF of 8-inch water main along the west side of Gall Boulevard beginning at Alston Ave and turning east on Tucker Road at the existing 8-ich water main on Tucker Road. Approximately 2,700 LF of the water main will be installed using horizontal directional drilling; the remainder will be installed using open-cut methods. The water main will connect to an existing 8-inch water main on Alston Ave and an 8-inch water main on Tucker Road, the project includes a 12-inch valve continuing South on 301 for a future connection.

The project is sized to accept future additional flows.

All design constraints will comply with the City's standard design requirements and State of Florida building requirements. Please download the package, plans, and specification for complete details.

Estimated Cost: **$1.7 million**

Hours of Operation: 7:00 AM – 6:00 PM, Monday – Friday

Completion Time: Total estimated project time is about 15 months from Notice to Proceed. Estimated 3 months for equipment procurement and 12 months for construction.

TelePreConference: **Monday, December 4, 2023 or City Hall 2nd Flr Conf Rm**
Link: **https://meet.goto.com/159259221**
Phone: **1-224-501-3412**
Access Code: **159-259-221**

This Teleconference will be hosted live at City Hall and via GoTo. Should you attend the meeting in person there will be a visit of the areas.

TIME TABLE

Bid Time Table	Date	Day	Time
Bid Distribution	11-20-23	Sunday	
Teleconference Pre-Bid*	12-04-23	Monday	10:00 AM
Equivalent/Question Deadline	12-29-23	Friday	10:00 AM
Response Deadline	01-12-24	Friday	10:00 AM
Presented to City Council	02-12-24	Monday	6:00 PM

*City Hall and/or Teleconference: You may need to type the link in manually in order for it to connect.

GoTo Link: https://meet.goto.com/159259221
Phone: +1 (224) 501-3412
Access Code: 159-259-221

Site visit of the area will follow the meeting.

This Teleconference will be hosted live at City Hall and via GoTo. Should you attend the meeting in person there will be a visit of the areas.

You may need to type the link into explorer rather than copy/paste.

THE AMERICAN INSTITUTE OF ARCHITECTS

Executed in Counterpart(s)

AIA Document A310

Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we (Here insert full name and address or legal title of Contractor/Vendor)

as Principal, hereinafter called the Principal, and (Here insert full name and address or legal title of Surety)

a corporation duly organized under the laws of the State of
as Surety, hereinafter called the Surety, are held and firmly bound unto
(Here insert full name and address or legal title of Owner)

Bonds and All Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

as Obligee, hereinafter called the Obligee, in the sum of ----------
----------**Dollars ($),**

for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, The Principal has submitted a bid for
(Here insert full name, address and description of project)

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and Sealed this _____ of _____ 2024

_____ ***(Seal)***
(Principal and Title)

_____ ***(Surety Seal)***
(Witness)

_____
(Attorney-in-Fact & Licensed Resident Agent)

SWORN STATEMENT PURSUANT TO SECTION 287.133(3)(a),

FLORIDA STATUTES ON PUBLIC ENTITY CRIMES- ITB-2023-03

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.

A. This sworn statement is submitted to _____
(print name of the public entity)

by _____
(print individual's name and title)

for _____
(print name of entity submitting sworn statement)

whose business address is

_____

_____

and (if applicable) its Federal Employer Identification Number (FEIN) is _____
(If the entity has no FEIN, include the Social ro Number of the individual signing this sworn statement: _____.)

B. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

C. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

D. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes means:

a. A predecessor or successor of a person convicted of a public entity crime; or
b. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

E. I understand that a "person" as defined in Paragraph 287.133(1)(e), Florida Statutes means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or

applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

F. Based on information and belief, the statement which I have marked below is true in relation to the
entity submitting this sworn statement. (Indicate which statement applies.)

_____Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (attach a copy of the final order)

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

_____
(Signature)

Sworn to and subscribed before me this _____ day of
_____, 2024.Personally or known_____
Or Produced identification_____Notary Public – State of _____

_____
My commission expires_____(Type of Identification) _____
(Printed, Typed or stamped commissioned name of notary public)

E-VERIFY CERTIFICATION FORM- ITB 2023-03

All vendors, contractors and subcontractors doing business with the City of Zephyrhills must certify that they have implemented the federal E-Verify program.

E-Verify is a federal system established by the Department of Homeland Security to determine the immigration and work-eligibility status of prospective employees. Detailed E-Verify program information for employers can be found at http://www.dhs.gov/e-verify.

Prior to providing goods or services to the City of Zephyrhills, vendors must certify compliance with the federal E-Verify program. In the case of contractors, this includes obtaining written certification from all subcontractors who will participate in the performance of the contract. The certification below has been prepared for all vendors and contractors to use for this purpose. All subcontractor certifications must be kept on file with the contract vendor and made available to the state and/or City upon request.

CERTIFICATION

(In accordance with Executive Order No. 11-02)

I certify that the company shown below is in compliance with the above statement and that I am authorized to sign on its behalf.

Name of Company: _____

Authorized Signature: _____

Printed Name/Title: _____

Address: _____

Date: _____

Phone: _____

Email: _____

The City of Zephyrhills reserves the right to determine how it will respond to any instances of non-compliance or false certification of compliance. Potential City actions include, but are not limited to, cancellation of the contract and/or suspending or debarring the contract vendor from performing services in any aspect to the City.

Please send the completed form with your submittal.

Addenda Receipt Acknowledgment- ITB 2023-03

Addendum #_____ Date _____ Initials_____

Addendum #_____ Date _____ Initials_____

Addendum #_____ Date _____ Initials_____

Addendum #_____ Date _____ Initials_____

Firm Representative:

_____

Signature/Date **(Executed by Corporate Authority)**

DRUG-FREE WORKPLACE FORM- ITB 2023-03

The undersigned vendor, in accordance with Florida Statute 287.087, hereby

certifies that _____ does:
(Name of Business)

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business' policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or pleas of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm fully complies with the above requirements.

_____
Bidder's Signature

_____
Date

PUR062.036
re. 10/97

NON-COLLUSIVE AFFIDAVIT- ITB 2023-03

State of Florida
County of _____

_____ being first duly sworn, deposes and says that he/she is

_____, the party making the fore-going submittal of qualifications or bid that such submittal
(partner or officer of the Firm, etc)

Or bid is genuine and not collusive or sham; that said Firm has not colluded, conspired, connived or agreed, directly or indirectly, with any Firm or person, to put in a sham response or to refrain from responding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person, to secure any advantage against the City of Zephyrhills of any person interested in the proposed contract; and that all statements in said response are true.

_____
Officer

_____ *(Company Name)*

State of Florida
County of _____

The foregoing instrument was acknowledged before me this _____ day of _____ by
_____ *(name and title of corporate officer)*
of _____ *(Name of Corporation),*
a _____ *(state or place of incorporation)* corporation, on behalf of the corporation. He/she is personally known to me or has produced _____ *(Identification type)* as identification.

_____ *(Signature line for notary public)*

_____ *(Name of notary type, printed or stamped)*

_____ *(Title or rank)*

My commission expires: _____
Serial number, if any _____

Errors or Omissions- ITB 2023-03

Upon review of this project's plans and construction documents are you aware of any apparent errors or omissions?

☐ YES

☐ No

If YES, please provide a detailed explanation of any apparent errors or omissions on this sheet.

Company Representative Date

REFERENCES –PROJECTS OF SIMILAR SCOPE- ITB 2023-03

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 2: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 3: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 4: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

REFERENCES –FOR CURRENTLY ACTIVE PROJECTS- ITB 2023-03

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 2: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 3: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Reference 4: Company Name:_____
Project Name: _____ Project Amount: $_____
Start Date: _____ Finished Date:_____
Description:_____
_____
_____
_____
Contact Name: _____Phone:_____
Email:_____Within Budget: YES □ NO □*Explain
_____

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion Form- ITB 2023-03

1. The prospective Vendor, _____, certifies, by submission of this document, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any Federal Department or Agency.

2. Where the Vendor is unable to certify to the above statement, the prospective Vendor shall attach an explanation to this form.

Vendor: _____
Name of Company – Please Print

Signature: _____
Authorized Company Representative

Name/Title: _____

Address: _____

_____

Date: _____

CITY OF ZEPHYRHILLS

STATEMENT OF NO BID

If you do not intend to bid, please complete the information below and return this form with the bid title and number clearly marked on the front of the envelope. Please send the STATEMENT OF NO BID FORM no later than the opening date indicated on the INVITATION TO BID FORM.

Please be advised that if the NO BID STATEMENT is not executed and returned your name may be deleted from the list of qualified bidders for the City of Zephyrhills.

We decline to submit a bid for the following reasons:

- ❑ Unable to meet Bond or Insurance requirements.
- ❑ Unable to meet specifications; we do not offer this product or an equivalent.
- ❑ Specifications are unclear, specialty items or too intricate.
- ❑ Insufficient time to respond; our schedule will not permit us to perform.
- ❑ Reason for declining on attached sheet.

Company Name: _____ Date: _____

Telephone Number: _____ Signature: _____

Return completed form to: **City of Zephyrhills, Purchasing Office**
5335 8th Street
Zephyrhills, FL 33542

CERTIFICATION OF CONTRACTOR REGARDING TRENCH SAFETY- ITB 2023-03

This certification is required pursuant to the Trench Safety Act, Chapter 90-98, Florida Statutes regarding Trench Safety. The Act specifically incorporates the Occupational Safety and Health Administration's excavation safety standards, 29 CFR S. 1928.650 Subpart P as the State standard. Any revision to OSHA's safety standards that are consistent with the Florida Statues shall also be complied with upon its effective date. The act requires that any bidder or prospective contractor, or any of their proposed subcontractors, shall provide written assurance that the contractor will comply with the applicable trench safety standards.

Name of Contractor: _____

Address: _____

_____

Phone: _____

1. Contractor agrees that he is aware of the Trench Safety Act and the requirements of the Act.
2. Contractors agrees to comply with all applicable trench safety standards as set forth in the Act and as referenced in the Act.

Name of Signer: _____
PLEASE PRINT

Title: _____

Signature: _____

Date: _____

AIA® Document G701™ – 2017

Change Order

PROJECT: *(name and address)*	CONTRACT INFORMATION: Contract For: Date:	CHANGE ORDER INFORMATION: Change Order Number: Date:
OWNER: *(name and address)*	ARCHITECT: *(name and address)*	CONTRACTOR: *(name and address)*

THE CONTRACT IS CHANGED AS FOLLOWS:
(Insert a detailed description of the change and, if applicable, attach or reference specific exhibits. Also include agreed upon adjustments attributable to executed Construction Change Directives.)

The original (Contract Sum) (Guaranteed Maximum Price) was	$ _____
The net change by previously authorized Change Orders	$ _____
The (Contract Sum) (Guaranteed Maximum Price) prior to this Change Order was	$ _____
The (Contract Sum) (Guaranteed Maximum Price) will be (increased) (decreased) (unchanged) by this Change Order in the amount of	$ _____
The new (Contract Sum) (Guaranteed Maximum Price), including this Change Order, will be	$ _____
The Contract Time will be (increased) (decreased) (unchanged) by	( ) days.
The new date of Substantial Completion will be	

NOTE: This Change Order does not include adjustments to the Contract Sum or Guaranteed Maximum Price, or the Contract Time, that have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

ARCHITECT *(Firm name)*	CONTRACTOR *(Firm name)*	OWNER *(Firm name)*
SIGNATURE	SIGNATURE	SIGNATURE
PRINTED NAME AND TITLE	PRINTED NAME AND TITLE	PRINTED NAME AND TITLE
DATE	DATE	DATE

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SOUTH 301 W WATER AND WASTEWATER PIPELINES

BID DOCUMENTS
AND
TECHNICAL SPECIFICATIONS

Project No. 26110-051-01

Owner:

CITY OF ZEPHYRHILLS
5335 8th Street
Zephyrhills, Florida 33542

Zephyrhills
Utilities Department

Engineer:

JONES EDMUNDS & ASSOCIATES, INC.
3910 S. Washington Avenue, Suite 210
Titusville, Florida 32780

November 2023

CITY OF ZEPHYRHILLS
SOUTH 301 W WATER AND WASTEWATER PIPELINES
TECHNICAL SPECIFICATIONS

Kenneth A Fraser

Digitally signed by Kenneth A Fraser
Date: 2023.11.08 13:13:24 -05'00'

Kenneth Acie Fraser, PE, Florida Professional Engineer No. PE57452
This item has been digitally signed and sealed by Kenneth Acie Fraser, PE, on the date indicated here. Printed copies of this document are not considered signed and sealed. The signature must be verified on any electronic copies. The above-named Professional Engineer shall be responsible for the following Divisions in accordance with Rule 61G15-23.004, FAC:
Divisions 1, 2, 3, 5, 9, 15
Jones Edmunds & Associates, Inc.

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DIVISION 0

BIDDING AND CONTRACTING REQUIREMENTS

CITY OF ZEPHYRHILLS
FRONT-END DOCUMENTATION

CITY OF ZEPHYRHILLS
South 301 W Water and Wastewater Pipelines
CONSTRUCTION ITEMIZED PRICING SHEET

Item No.	Item Description	Qty.	Unit	Unit Price	Amount
BASE BID					
1	Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions	1	LS		
2	Traffic Control	1	LS		
3	Environmental Protection	1	LS		
4	Construction Survey and Layout	1	LS		
5	6-Inch Sanitary Sewer Force Main via Open-Cut	1,530	LF		
6	6-inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	4,300	LF		
7	8-Inch Potable Water Main via Open-Cut	310	LF		
8	8-inch Potable Water Main via HDD	2,400	LF		
9	Combination Air/Vacuum Valves and Vaults	10	EA		
10	Concrete Restoration	55	SY		
11	Limerock Restoration	55	SY		
12	Asphalt Concrete Restoration	50	SY		
13	Testing Allowance	1	AL		
14	Record Drawings Allowance	1	AL		
	TOTAL BID PRICE				

DIVISION 1

GENERAL REQUIREMENTS

SECTION 01000
PROJECT REQUIREMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Work to be done consists of the furnishing of all labor, materials, and equipment and the performance of all Work included in this Contract. The summary of the Work is presented in Section 01100, Summary of Work.

B. Work Included

1. The Contractor shall furnish all labor, superintendence, materials, plant power, light, heat, fuel, water, tools, appliances, equipment, supplies, and means of construction necessary for proper performance and completion of the Work. The Contractor shall obtain and pay for all necessary local building permits. The Contractor shall perform and complete the Work in the manner best calculated to promote rapid construction consistent with safety of life and property and to the satisfaction of the Engineer and in strict accordance with the Contract Documents. The Contractor shall clean up the Work and maintain it during and after construction, until accepted, and shall do all Work and pay all costs incidental thereto. He shall repair or restore all structures and property that may be damaged or disturbed during performance of the Work.
2. The cost of incidental work described in these Project Requirements for which there are no specific Contract Items shall be considered as part of the general cost of doing the Work and shall be included in the prices for the various Contract Items. No additional payment will be made therefor.
3. The Contractor shall provide and maintain such modern plant, tools, and equipment as may be necessary, in the opinion of the Engineer, to perform in a satisfactory and acceptable manner all the Work required by this Contract. Only equipment of established reputation and proven efficiency shall be used. The Contractor shall be solely responsible for the adequacy of his workmanship, materials, and equipment, prior approval of the Engineer notwithstanding.

C. Public Utility Installations and Structures

Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, vaults, manholes, and all other appurtenances and facilities pertaining thereto whether owned or controlled by the Owner, other governmental bodies, or privately owned by individuals, firms, or corporations

used to serve the public with transportation, traffic control, gas, electricity, telephone, sewerage, drainage, water, or other public or private property which may be affected by the Work shall be deemed included hereunder.

1. The Contract Documents contain data relative to existing public utility installations and structures above and below the ground surface. These data are not guaranteed as to their completeness or accuracy and it is the responsibility of the Contractor to make his own investigations to inform himself fully of the character, condition, and extent of all such installations and structures as may be encountered and as may affect the construction operations.
2. The Contractor shall protect all public utility installations and structures from damage during the Work. Access across any buried public utility installation or structure shall be made to avoid any damage to these facilities. All required protective devices and construction shall be provided by the Contractor at his expense. All existing public utilities damaged by the Contractor shall be repaired by the Contractor, at his expense. No separate payment shall be made for such protection or repairs to public utility installations or structures.
3. Public utility installations or structures owned or controlled by the Owner or other governmental body which are shown on the Drawings to be removed, relocated, replaced, or rebuilt by the Contractor shall be considered as a part of the general cost of doing the Work and shall be included in the prices bid for the various Contract Items. No separate payment shall be made therefor.
4. Where public utility installations of structures owned or controlled by the Owner or other governmental body are encountered during the Work and are not indicated on the Drawings or in the Specifications, and when, in the opinion of the Engineer, removal, relocation, replacement, or rebuilding is necessary to complete the Work under this Contract, such Work shall be accomplished by the utility having jurisdiction, or such Work may be ordered, in writing by the Engineer, for the Contractor to accomplish. If such work is accomplished by the utility having jurisdiction it will be carried out expeditiously, and the Contractor shall give full cooperation to permit the utility to complete the removal, relocation, replacement, or rebuilding as required. If such work is accomplished by the Contractor, it will be paid for as extra work as provided in the Agreement.
5. At all times in performance of the Work the Contractor shall employ acceptable methods and exercise reasonable care and skill so as to avoid unnecessary delay, injury, damage, or destruction of public utility installations and structures and shall at all times in the performance of the Work avoid unnecessary interference with or interruption of public utility services and cooperate fully with the owners thereof to that end.

6. The Contractor shall give written notice to the Owner and other governmental utility departments and other owners of public utilities of the location of his proposed construction operations at least 48 hours in advance of breaking ground in any area or on any unit of the Work.
7. The maintenance, repair, removal, relocation, or rebuilding of public utility installations and structures, when accomplished by the Contractor as herein provided, shall be done by methods approved by the owners of such utilities.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 DRAWINGS AND PROJECT MANUAL

A. Drawings: When obtaining data and information from the Drawings, figures shall be used in preference to scaled dimensions and large-scale drawings in preference to small-scale drawings.

B. Supplementary Drawings

1. When, in the opinion of the Engineer, it becomes necessary to explain more fully the Work to be done or to illustrate the Work further or to show any changes which may be required, the Engineer will prepare drawings known as Supplementary Drawings, with specifications pertaining to such Drawings, and the Contractor will be furnished one complete set of reproducible black line prints (24 inches by 36 inches) and one reproducible copy of the specifications.
2. The Supplementary Drawings shall be binding upon the Contractor with the same force as the Contract Drawings. Where such Supplementary Drawings require either less or more than the estimated quantities of Work, credit to the Owner or compensation therefor to the Contractor shall be subject to the terms of the Agreement.

C. Contractor to Check Drawings and Data

1. The Contractor shall verify all dimensions, quantities, and details shown on the Drawings, Supplementary Drawings, Schedules, Specifications, or other data received from the Engineer, and shall notify the Engineer of all errors, omissions, conflicts, and discrepancies found therein. Failure to discover or correct errors, conflicts, or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory work, faulty construction, or improper operation resulting therefrom, nor from rectifying such conditions at his own expense. He will not be allowed to take advantage of any errors or omissions, as full instructions will be furnished by the Engineer should such errors or omissions be discovered.
2. All schedules are given for the convenience of the Engineer and the Contractor and are not guaranteed to be complete. The Contractor shall assume all responsibility or the making of estimates of the size, kind, and quality of materials and equipment included in Work to be done under the Contract.

D. Specifications: The Technical Specifications each consist of three parts: General, Products, and Execution. The General part of a Specification contains General Requirements which govern the Work. The Products and Execution parts modify and supplement the General Requirements by detailed requirements for the Work and shall always govern whenever there appears to be a conflict.

E. Intent

1. All Work called for in the Specifications applicable to this Contract, but not shown on the Drawings in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified in either the Drawings or in the Specifications but involved in carrying out their intent or in the complete and proper execution of the Work is required and shall be performed by the Contractor as though it were specifically delineated or described.
2. The apparent silence of the Specifications as to any detail or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used. The interpretation of these Specifications shall be made upon that basis.

1.05 MATERIALS AND EQUIPMENT

A. Manufacturer

1. All transactions with the manufacturers or subcontractors shall be through the Contractor unless the Contractor shall request and at the Engineer's option that the manufacturer or subcontractor deal directly with the Engineer. Any such transactions shall not in any way release the Contractor from his full responsibility under this Contract.
2. Any two or more pieces of material or equipment of the same kind, type, or classification, and being used for identical types of service, shall be made by the same manufacturer.

B. Delivery

1. The Contractor shall deliver materials in ample quantities to ensure the most speedy and uninterrupted progress of the Work so as to complete the Work within the allotted time.
2. The Contractor shall also coordinate deliveries in order to avoid delay in or impediment of the progress of the work of any related Contractor.

C. Tools and Accessories

1. Unless otherwise stated in the Contract Documents, the Contractor shall furnish with each type, kind, or size of equipment, one complete set of suitably marked high-grade special tools and appliances which may be needed to adjust, operate, maintain, or repair the equipment. Such tools and appliances shall be furnished in approved painted steel cases, properly labeled and equipped with good-grade cylinder locks and duplicate keys.
2. Spare parts shall be furnished as specified herein and as recommended by the manufacturer necessary for the operation of the equipment, not including materials required for routine maintenance.
3. Each piece of equipment shall be provided with a substantial nameplate, securely fastened in place, and clearly inscribed with the manufacturer's name, year of manufacture, serial number, weight, and principal rate data.

D. Service of Manufacturer's Engineer

1. The Contract Prices for equipment shall include the cost of furnishing a competent and experienced engineer or superintendent who shall represent the manufacturer and shall help the Contractor, when required, install, adjust, test, and place in operation the equipment in conformity with the Contract Documents.

2. After the equipment is placed in permanent operation by the Owner, the engineer or superintendent shall make all adjustments and tests required by the Engineer to prove that the equipment is in proper and satisfactory operating condition and shall instruct such personnel as may be designated by the Owner in the proper operation and maintenance of such equipment.

1.06 INSPECTION AND TESTING

A. General

1. For tests specified to be made by the Contractor, the testing personnel shall make the necessary inspections and tests, and the reports thereof shall be in such form as will facilitate checking to determine compliance with the Contract Documents. Five copies of the reports shall be submitted and authoritative certification thereof must be furnished to the Engineer as a prerequisite for the acceptance of any material or equipment.
2. If, in the making of any test of any material or equipment, the Engineer ascertains that the material or equipment does not comply with the Contract Documents, the Contractor will be notified thereof and he will be directed to refrain from delivering said material or equipment, or to remove it promptly from the site or from the Work and replace it with acceptable material without cost to the Owner.
3. Tests of electrical and mechanical equipment and appliances shall be conducted in accordance with the recognized test codes of the ANSI, ASME, or the IEEE, except as may otherwise be stated herein.
4. The Contractor shall be fully responsible for the proper operation of equipment during testing and instruction periods and shall neither have nor make any claim for damage which may occur to equipment before the time when the Owner formally takes over the operation thereof.

B. Costs

1. The Contractor shall provide all inspection and testing of materials furnished under this Contract, unless otherwise expressly specified.
2. The Contractor shall bear the cost of shop and field tests of equipment and of certain other tests specifically called for in the Contract Documents, and such costs shall be deemed to be included in the Contract Price.
3. The Owner may test materials and equipment submitted by the Contractor as the equivalent to those specifically named in the Contract for compliance. The Contractor shall reimburse the Owner for the expenditures incurred in making such tests of materials and equipment which are rejected for non-compliance.

C. Certificate of Manufacture

1. The Contractor shall furnish the Engineer with authoritative evidence in the form of a certificate of manufacture that the materials to be used in the Work have been manufactured and tested in conformity with the Contract Documents.
2. These certificates shall be notarized and shall include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product or on similar products of the manufacturer.

D. Shop Tests

1. Each piece of equipment for which pressure, duty, capacity, rating, efficiency, performance, function, or special requirements are specified shall be tested in the shop of the maker in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents.
2. Five copies of the manufacturer's actual test data and interpreted results thereof, accompanied by a certificate of authenticity sworn to by a responsible official of the manufacturing company and/or independent laboratory, shall be submitted to the Engineer for approval.
3. The Contractor shall bear the cost of shop tests and of furnishing manufacturer's preliminary and shop test data of operating equipment.

E. Start-up Tests

1. As soon as conditions permit, the Contractor shall furnish all labor, materials, and instruments and shall make start-up tests of equipment.
2. If the start-up tests disclose any equipment furnished under this Contract which does not comply with the requirements of the Contract Documents, the Contractor shall, before demonstration tests, make all changes, adjustments, and replacements required. The furnishing contractor shall assist in the start-up tests as applicable.

F. Demonstration Tests

1. Before the Contractor's request for a Substantial Completion inspection, all equipment and piping installed under this Contract shall be subjected to demonstration tests as specified or required to prove compliance with the Contract Documents.
2. The Contractor shall furnish labor, fuel, energy, water, and all other materials, equipment, and instruments necessary for all demonstration tests at no additional cost to the Owner. The Contractor shall assist in the demonstration tests as applicable.

1.07 LINES AND GRADES

A. Grade

1. All work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings or as given by the Engineer. The full responsibility for keeping alignment and grade shall rest upon the Contractor.
2. The Engineer will establish bench marks and provide coordination points. Reference marks for lines and grades as the Work progresses will be located by the Contractor to cause as little inconvenience to the prosecution of the Work as possible. The Contractor shall place excavation and other materials so as to cause no inconvenience in the use of the reference marks provided. He shall remove any obstructions he places contrary to this provision.

B. Surveys

1. At his own expense, the Contractor shall furnish and maintain stakes and other such materials.
2. The Contractor shall check such reference marks by such means as he may deem necessary and, before using them, shall call the Engineer's attention to any inaccuracies.
3. At his own expense, the Contractor shall establish all working or construction lines and grades as required from the reference marks set by the Engineer and shall be solely responsible for the accuracy of these lines and grades. He shall, however, be subject to check and review by the Engineer.

C. Safeguarding Marks

1. The Contractor shall safeguard all points, stakes, grade marks, monuments, and bench marks made or established on the Work, bear the cost of re-establishing them if disturbed, and bear the entire expense of rectifying work improperly installed due to not maintaining or protecting or to removing without authorization such established points, stakes, and marks.
2. The Contractor shall safeguard all existing and known property corners, monuments, and marks adjacent to but not related to the Work and shall bear the cost of re-establishing them if they are disturbed or destroyed.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01100
SUMMARY OF WORK

PART 1 GENERAL

1.01 SCOPE OF WORK

Unless otherwise expressly provided in the Contract Documents, the Work must be performed in accordance with best modern practice, with materials and workmanship of the highest quality to the satisfaction of the Owner.

A. The Project title is:

South 301 W Water and Wastewater Pipelines
City of Zephyrhills, Pasco County, Florida
Jones Edmunds Project No. 26110-051-01

B. The Work of this Project includes:

1. Installing approximately 6,000 linear feet (LF) of 6-inch sanitary sewer force main beginning at C Avenue on Gall Boulevard turning onto Tucker Road and ending west of the railroad tracks. Approximately 4,600 LF of the force main will be installed using horizontal directional drilling (HDD); the remainder will be installed using open-cut methods.
2. Installing approximately 3,000 LF of 12-inch potable water main along Gall Boulevard between Alston Avenue and Tucker Road. Approximately 2,700 LF of the potable water main will be installed using HDD; the remainder will be installed using open-cut methods.
3. Project restoration will include repairing pavement, re-sodding of affected areas, and replacing concrete curb/gutter and sidewalk.

C. The Specification divisions and Drawings are an integrated part of the Contract Documents and, as such, will not stand alone if used independently as individual sections, divisions, or drawing sheets. The Drawings and Specifications establish minimum standards of quality for this project. They do not purport to cover all details entering into the design and construction of materials and equipment.

1.02 REFERENCE STANDARDS

Reference standards and recommended practices referred to herein shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Association of State Highway and Transportation Officials (AASHTO) Formerly (AASHO)
B. American Concrete Institute (ACI)
C. American Institute of Steel Construction (AISC)
D. American Iron and Steel Institute (AISI)
E. American National Standards Institute (ANSI)
F. American Standards Association (ASA)
G. American Society of Mechanical Engineers (ASME)
H. American Society of Testing and Material (ASTM)
I. American Water Works Association (AWWA)
J. American Welding Society (AWS)
K. Anti-Friction Bearing Manufacturer's Association (AFBMA)
L. Building Officials and Code Administrators International, Inc. (BOCA)
M. Construction Specifications Institute (CSI)
N. Federal Specification (FS)
O. Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction, Latest English Edition (Standard Specifications)
P. FDOT Roadway and Traffic Design Standards Latest English Edition (FDOT Index)
Q. Geosynthetics Institute (GSI)
R. National Bureau of Standards (NBS)
S. National Electrical Manufacturer's Association (NEMA)
T. National Fire Protection Association (NFPA)
U. Portland Cement Association (PCA)
V. Occupational Safety and Health Act (Public Law 91-596), U.S. Department of Labor (OSHA)
W. Steel Structures Painting Council (SSPC)
X. Southern Standard Building Code (SSBC)
Y. Underwriters' Laboratories, Inc. (UL)
Z. United States of America Standards Institute (USASI)
AA. Regulations of Florida Industrial Commission Regarding Safety
BB. All local, state, county, or municipal building codes requirements of the Owner's Insurance

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.05 GENERAL REQUIREMENTS

A. Unless otherwise specified on the Construction Drawings or Specifications, all work and the quality of materials shall conform to the referenced sections of the Florida Department of Transportation (FDOT) *Standard Specifications for Road and Bridge Construction, Supplementary Specifications*, and *Roadway and Traffic Design Standards*. The Contractor shall retain on the job site copies of these standard FDOT documents. The basis of payment shall conform to Section 01200, Measurement and Payment, of the General Requirements.

1.06 WORKING HOURS

A. Work under this contract shall not be prosecuted on Saturdays, Sundays or on State and/or National holidays, except in time of emergency, and then only under written permission from the Owner who shall be the sole judge as to the urgency of that situation. On weekdays the workday shall be limited to daylight hours.

B. If the Contractor deems it necessary to work on Sundays, holidays, or beyond daylight hours to comply with his construction schedule or because of an emergency, the Contractor shall request permission of the Owner to do so. If, in the opinion of the Owner, the need is bona fide, the Owner will authorize the Contractor to work such hours as may be necessary.

1.07 REIMBURSEMENT FEES

A. The following rates shall be applied as the Owner's reimbursement of the Engineer's fee to be paid by the Contractor for expenses defined in Supplementary Conditions SC-6.02.C, SC-6.05.A.2.f, SC-6.17.E.2, SC-9.05.B, and SC-13.03.A.

1.	Field Representative (Construction):	$125.00
2.	Construction Administrator:	$155.00
3.	Engineering Consultant (Project Manager):	$200.00
4.	Engineering Consultant (Chief Engineer):	$265.00
5.	CADD/Designer:	$125.00
6.	Administrative Assistant:	$ 80.00

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01200
MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers methods of measurement and payment for items of work under this Contract.

B. The total Contract Price shall cover all work required by the Contract Documents. All cost in connection with the proper and successful completion of the work, including furnishing all materials, equipment, and tools and performing all necessary labor and supervision to fully complete the work, shall be included in the unit price and lump-sum Bid prices. All work not specifically set forth as a pay item in the Bid Form or Bid Schedule shall be considered a subsidiary/ ancillary obligation of the Contractor and all costs in connection with these subsidiary/ancillary obligations shall be included in the Bid(s) to provide a complete and functional Project.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 EXCAVATION, TRENCHING, AND CLEARING

A. Except where otherwise specified, the unit price or lump-sum price bid for each item of work which involves excavation, trenching, clearing, grubbing, or disposal of cleared and grubbed materials shall include all costs for such work. No direct payment shall be made for clearing, grubbing, disposal of cleared or grubbed materials, excavation, trenching, disposal of surplus excavated material, handling water (and groundwater) and purchasing and hauling of required fill material. All excavation and trenching shall be unclassified as to materials which may be encountered; in addition, trenches shall be unclassified as to depth, unless otherwise stated.

1.05 LUMP SUM

A. For lump-sum items, payments shall be made to the Contractor in accordance with an accepted Progress Schedule of Values on the basis of actual work completed and accepted by the Owner at the final completion of the Project.

1.06 UNIT PRICE

A. For unit price items, payment shall be made based on the actual amount of work accepted by the Owner and for the actual amount of materials in place at the final completion of the Project, as confirmed by the final measurements.

B. After the work is completed and before final payment is made, the Engineer will make final measurements, with all required assistance from the Contractor, to determine the quantities of various items of work accepted as the basis for the final unit price payment.

1.07 PAYMENT FOR INCREASED OR DECREASED QUANTITIES

A. When alterations in the quantities of unit price work not requiring a Change Order(s), as herein provided for, are ordered and performed, the Contractor shall accept payment in full at the Contract unit price multiplied by the actual quantities of work constructed and accepted by the Owner at the completion of the project.

B. The actual percentage of each lump sum bid item completed by the Contractor and accepted by the Owner at the final completion of the Project will be paid to the Contractor.

1.08 DELETED ITEMS

A. Should any items contained in the Bid Schedule(s) be found unnecessary for the proper completion of the work contracted, the Engineer may eliminate such items from the Contract. This action shall in no way invalidate the Contract and no financial allowance or compensating payment for anticipated profit, overhead, etc., will be made for items so eliminated in making final payment to the Contractor.

1.09 PARTIAL PAYMENTS

A. Partial payments shall be made monthly as the work progresses. Partial payment shall be made subject to the provisions of the General and Supplementary Conditions.

1.10 PAYMENT FOR STORED MATERIAL DELIVERED TO THE PROJECT

A. When requested by the Contractor and at the discretion of the Owner, payment may be made for all or part of the value of acceptable materials and equipment to be incorporated into bid items, which have not been used, and which have been delivered to the construction site or placed in storage places acceptable to the Owner. The Contractor shall provide receipts for all stored material items requested for reimbursement which clearly identify the stored material item, where it is to be constructed, the unit cost of the item, as well as the total cost of the delivered item(s), the quantity of the item, the brand name of the item, and the supplier. Note that there are additional documentation requirements and storage requirements within the Contract Documents that must also be met before the Contractor can be reimbursed for these stored materials.

B. No payment shall be made for fuels, supplies, installation or connection hardware, lumber, false work, or other similar materials or on temporary structures or other work (items) of any kind which are not a permanent part of the Contract. Items having a value of less than $2,500 shall not be compensated for as a stored material item.

1.11 FINAL PAYMENT

A. If requested by the Engineer, the Contractor shall field verify all quantities in dispute by using visual observation, taped measurements, or other methods designated by the Engineer. The field verification shall be made in the presence of the Engineer and agreed to by both the Engineer and the Contractor. The Engineer will prepare a final adjusting Change Order which will adjust the final quantities of the project Bid Schedule to reflect the actual work accepted by the Owner and for which the Contractor will be compensated.

1.12 SCHEDULE OF VALUES

A. A schedule of values for the lump-sum bid items and some of the unit price bid items as required by the Engineer shall be submitted and accepted before the first pay request is approved by the Engineer. The schedule of values shall be based on the prices bid in the Bid Schedule(s). Prices bid in the Bid Schedule(s) cannot be changed in the schedule of values; they can only be broken down into more detail so that the Engineer can more accurately review and approve the Contractor’s pay application for the completed work.

1.13 MISCELLANEOUS CONSTRUCTION ITEMS

A. When pipe/service lines are constructed across a road, the road shall not be cut to perform this construction unless authorized in writing by the Engineer. Service

lines are to be bored, jack and bored, or horizontally directionally drilled (HDD) under the road. Jetting of water lines or water service lines will not be allowed.

B. The Contractor shall take all precautions necessary to protect existing utilities, roads, and miscellaneous items from damage during construction.

C. The Contractor shall repair, relocate, or replace existing utilities, roadways, and miscellaneous items to pre-construction conditions.

D. All repairs, relocations, and replacements necessary are considered incidental to the work and will be at the Contractor's cost, with no cost to the Owner.

E. The unit-price bid items and lump-sum bid items for all pipe items shall constitute full compensation for furnishing, laying, jointing, and testing of pipe; dewatering; excavation and backfill; and cleanup. All pipe lines, including but not limited to water lines, force mains, and gravity sewer lines, which are to be paid for per linear foot in the Bid Schedule, will be measured for payment only on a horizontal plane after installation, unless otherwise noted.

F. Payment for the water services, fire hydrants, and isolation valve bid items shall not be made until the associated Water Service Cards, Fire Hydrant Cards, and Isolation Valve Cards have been properly filled out, signed by the Contractor, and accepted by the Engineer as completed installations. Samples of the Water Service Card, Fire Hydrant Card, and Isolation Valve Card are located at the end of Specification Section 15110, Manual, Check, and Process Valves. The Contractor shall make all required copies of the cards for use in the work.

G. The Contractor shall have the City observe and document the installation of each underground fitting on the project. If the installation of any fitting is not confirmed and documented by the City, it shall not be paid for by the Owner.

PART 2 PAY ITEM DESCRIPTIONS

2.01 BID – SOUTH 301 W WATER AND WASTEWATER PIPELINES

The descriptions provided in the following Paragraphs are to be used by the Bidder in preparing the Bid Schedule(s). They generally indicate how the major workscope items and their respective costs are to be separated into the line items listed in the Bid Schedule(s). These descriptions are not fully representative nor all-inclusive of the work required to complete the project in accordance with the Contract Documents. It is the Bidder's responsibility to include all required costs within the most appropriate line item(s).

BASE BID

Item 1. Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions (not to exceed 5% of the Base Bid)—This item shall include and cover the costs for performing construction; preparatory and overhead operations including but not limited to movement of personnel and equipment to and from the site; sanitary facilities; project administration and management; insurance; Owner and Engineer indemnification; temporary utilities; permits related to construction; performance and payment bonds in accordance with Florida Statutes 225.05; site safety and health program during the execution of the Construction Contract that complies with all local, state, and federal safety guidelines and laws; and all other similar activities and facilities necessary for executing this project. This lump-sum item shall not exceed 5% of the Base Bid amount. The Contractor will be paid 20% of this item upon completion of mobilization and 10% upon demobilization; the remainder will be prorated equally over the construction period.

Item 2. Traffic Control—The Contractor shall furnish all labor, signage, barricades, and other equipment necessary to provide traffic control in accordance with the Florida Department of Transportation (FDOT) Standard Specifications for all phases of work and all other maintenance of traffic plans as may be required by local, county, or state agencies. The Contractor will be paid 40% of this lump-sum item upon delivery and set up of the materials, and the remainder will be prorated equally over the construction duration.

Item 3. Environmental Protection—This item shall include but not be limited to all costs for providing a comprehensive environmental protection program for the project site and other areas as may be affected by the construction. This includes providing labor and materials necessary to prevent environmental damage to the ground, water, and air in conformance with all local, state, and federal laws. Examples include control of stormwater, erodible soils, noise, dust, pollutants, trash, waste, pumping discharge, and any other substance or activity that may adversely impact the environment. The Contractor will be paid 40% upon delivery and set up of the materials, and the remainder will be prorated equally over the construction period.

Item 4. Construction Survey and Layout—This item shall include all costs for providing the services of a Professional Land Surveyor to perform pre-construction stakeout; establish vertical control; and establish horizontal control, right-of-way locations, property boundary locations, and Record Drawing information verification and certification in accordance with the Contract Documents and to the satisfaction of the Owner. The Contractor will be paid 40% of this lump-sum item upon initial project layout, and the remainder will be prorated equally over the duration of construction.

Item 5. 6-Inch Sanitary Sewer Force Main via Open-Cut—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 6-inch sanitary sewer force mains installed by open cut as shown on the Drawings in accordance with the Contract Documents, including but not limited to all polyvinyl chloride (PVC) pipe, ductile iron (DI) pipe, DI fittings and connections, pipe restraints, end plugs, tracing wire, flushing of all

lines, connections, excavation, backfill, compaction, sodding/seeding, pressure testing, all associated appurtenances, and any other incidentals necessary for a complete and operable system as designed. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 6. 6-Inch Sanitary Sewer Force Main via Horizontal Directional Drilling (HDD)—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 6-inch sanitary sewer force main via HDD as shown on the Drawings in accordance with the Contract Documents, including but not limited to bore pits, piping, boring, reaming, back-reaming, slurry, slurry relief holes, installing the pipe in the bore, connections and transition couplings, high-density polyethylene (HDPE) reducers, HDPE fittings, removing or avoiding obstructions in the path of the HDPE pipe, existing utility coordination and relocation, excavation, backfill, compaction, sodding/seeding, site restoration, pressure testing, disinfection, disposal of soil (including disposal of soil/slurry mixture), and all associated appurtenances. Concrete, asphalt, or limerock repairs required specifically for the HDD installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 7. 8-Inch Potable Water Main via Open-Cut—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 8-inch potable water main via open-cut as shown on the Drawings in accordance with the Contract Documents, including but not limited to all PVC pipe, DI fittings and connections, pipe restraints, end plugs, fire hydrants, tracing wire, flushing of all lines, connections, excavation, backfill, compaction, sodding/seeding, landscape restoration, mailbox and other improvements restoration, existing utility coordination and relocation, pressure testing, bacteriological testing, all associated appurtenances, and any other incidentals necessary for a complete and operable system as designed. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe. No deduction in length will be made for the space occupied by valves or fittings. Concrete, asphalt, or limerock repairs required specifically for the open-cut water main installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid on a unit-price basis for each linear foot of water main installed complete as measured in place.

Item 8. 8-Inch Potable Water Main via HDD—The Contractor shall furnish all labor, materials, equipment, and services for constructing and placing into operation the 8-inch potable water main via HDD as shown on the Drawings in accordance with the Contract Documents, including but not limited to bore pits, piping, bore, reaming, back-reaming, slurry, slurry relief holes, installing the pipe in the bore, connections and transition couplings, HDPE reducers, HDPE fittings, removing or avoiding obstructions in the path of the HDPE pipe, existing utility coordination and relocation, excavation, backfill, compaction, sodding/seeding, site restoration, pressure testing, disinfection, disposal of soil (including disposal of soil/slurry mixture), and all

associated appurtenances. Concrete, asphalt, or limerock repairs required specifically for the HDD installation will be paid under their corresponding Bid Unit Price items. The Contractor will be paid for each linear foot of pipe installed as measured along the horizontal projection of the center line of the pipe installed complete as measured in place. No deduction in length will be made for the space occupied by valves or fittings.

Item 9. Combination Air/Vacuum Valves and Vaults—The Contractor shall furnish and install all labor, materials, equipment, and services for constructing and placing into operation combination air/vacuum valves and vaults as shown on the Drawings in accordance with the Contract Documents, including but not limited to combination air/vacuum valves, pipe saddles, corporation stops, pipe, fittings, isolation valves, gravel bedding, valve boxes, valve manholes with H-20 traffic covers, ARV enclosure, excavation, backfill, and appurtenances. The Contractor will be paid for each combination air/vacuum valve and vault installed complete as measured in place.

Item 10. Concrete Restoration—The Contractor shall furnish all labor, materials, equipment, and services for constructing the concrete restorations as shown on the Drawings in accordance with the Contract Documents, including but not limited to removing and disposing of existing concrete, surface preparation, earthwork, grading, fill, backfill, leveling (where required), concrete pavement, striping, marking, reflectors, and related appurtenances to the satisfaction of the Owner and the permitting agencies. The trench width will be paid according to the Specifications and detail widths. The Contractor will be paid on a unit-price basis for each square yard of concrete restored and installed complete as measured in place.

Item 11. Limerock Restoration—The Contractor shall furnish all labor, materials, equipment, and services for constructing the limerock restorations as shown on the Drawings in accordance with the Contract Documents, including but not limited to removing and disposing of or reusing existing limerock, surface preparation, earthwork, grading, fill, backfill, leveling (where required), and related appurtenances to the satisfaction of the Owner and the permitting agencies. The trench width will be paid according to the Specifications and detail widths. The Contractor will be paid on a unit-price basis for each square yard of limerock restored and installed complete as measured in place.

Item 12. Asphalt Concrete Restoration—The Contractor shall furnish all labor, materials, equipment, and services for constructing the asphalt restorations as shown on the Drawings in accordance with the Contract Documents, including but not limited to removing and disposing of existing asphalt, surface preparation, earthwork, grading, fill, backfill, prime and tack coats, leveling (where required), asphalt pavement, striping, marking, reflectors, and related appurtenances to the satisfaction of the Owner and the permitting agencies. The trench width will be paid according to the Specifications and detail widths. The Contractor will be paid on a unit-price basis for each square yard of asphalt concrete restored and installed complete as measured in place.

Item 13. Testing Allowance—The Contractor shall furnish all labor, materials, equipment, and services necessary for geotechnical in-place density testing of soils and pavement, concrete cylinder testing, and other testing as required by the Engineer and as specified in the Contract Documents. The Contractor will be reimbursed by the Owner for passing tests. Failed tests will not receive additional compensation.

Item 14. Record Drawings Allowance—The Contractor shall furnish all labor, materials, equipment, and services for composing and providing Record Drawings for the entire project in accordance with the Contract Documents, including but not limited to updating the electronic copy of the Drawings, identifying items that were revised during the project or addenda, having all Drawings signed and sealed by a Florida-certified Professional Land Surveyor, and providing signed-and-sealed paper copies of the Record Drawings. Once the Record Drawings have been determined by the Engineer to be complete according to the Specification requirements, the entire lump sum will be paid to the Contractor.

END OF SECTION

SECTION 01290
SCHEDULE OF VALUES

PART 1 GENERAL

1.01 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. To the Engineer, a proposed Schedule of Values allocated to the various portions of the Work, in accordance with Section 01000, Project Requirements, and Section 01200, Measurement and Payment.

B. Upon request of the Engineer, supporting data which will substantiate the values' correctness.

C. The accepted Schedule of Values shall be used only as the basis for the Contractor's Applications for Payment.

D. An update and resubmittal of the Schedule of Values when Change Orders affect the listing or when the actual performance of the Work involves necessary changes of substance to values previously listed and approved.

E. Schedule of Values

1. Submit typed schedule on EJCDC 1910-8-E forms provided by the Engineer. The Contractor's standard form or electronic media printout will be considered.
2. Submit Schedule of Values in duplicate within 10 days after the date of Owner-Contractor Agreement.
3. Format – Use the schedule of prices in the Bid Proposal. Show the cost breakdown for each lump-sum item. The lump-sum breakdown shall, at a minimum, use the Table of Contents of this manual outline. Identify each line item with the number and title of the major Specification Section. Identify site mobilization and demobilization, bonds and insurance, Record Drawings, photographs, and operations and maintenance manuals, etc.
4. For unit cost allowances, identify quantities taken from the Contract Documents multiplied by the unit cost to achieve the total for the item.
5. Include within each line item a direct proportional amount of the Contractor's overhead and profit.

6. Revise the schedule to list approved Change Orders with each Application for Payment.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 CASH ALLOWANCES

A. Costs Included in Allowances—The cost of the product to the Contractor or subcontractor, less applicable trade discounts and applicable taxes.

B. Costs Not Included in the Allowance, But Included in the Contract Price—Product handling at the site, including unloading, uncrating, and storage; protection of products from elements and from damage and labor for installation and finishing.

C. Contractor Responsibilities

1. Execute purchase agreement with designated supplier.
2. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
3. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

D. Differences between allowance amounts and actual costs will be adjusted by Change Order before final payment.

E. Cash Allowances Schedule

1. Testing.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01310
CONSTRUCTION COORDINATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall coordinate Work with that of other construction projects as needed.

B. Before starting Work and from time to time as the Work progresses, the Contractor and each subcontractor shall examine the work and materials installed by others as it applies to its own work and shall notify the Engineer immediately in writing if any conditions exist which will prevent satisfactory results in the installation of the system. Should the Contractor or subcontractor start work without such notification, it shall be construed as an acceptance of all claims or questions as to the suitability of the work of others to receive its Work. The Contractor shall remove and/or replace, at its own expense, all work under this Contract which may have to be removed on account of such defects or omissions.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. The Contractor shall ensure that all drawing, product data, and samples comply with Contract Documents and field dimensions and clearances.

B. The Contractor shall submit requests for interpretation of Contract Documents in a timely fashion to ensure there are no disruptions with the Work as scheduled. Obtain instructions through the Engineer to resolve all queries.

C. Process requests for substitutions and Change Orders through the Engineer.

D. Deliver close-out submittals to the Engineer.

1.03 WORK SEQUENCE

A. The Contractor shall submit a preliminary Progress Schedule, in accordance with Section 01320, Progress Schedule, to the Engineer. After review, the Contractor shall revise and resubmit the Progress Schedule to comply with requested revisions.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 CONSTRUCTION MOBILIZATION

The Contractor shall do the following:

A. Cooperate with the Owner in allocating mobilization areas on site for field offices and sheds, access, traffic, and parking facilities. During construction, the Contractor shall coordinate the use of the site and facilities through the Engineer.

B. Comply with the Engineer's procedures for intra-project communications: submittals, reports and records, schedules, coordination drawings, recommendations, and resolution of ambiguities/conflicts.

C. Comply with the Engineer’s instructions for use of temporary utilities and construction facilities.

D. Coordinate field engineering and layout work under instructions of the Engineer.

E. Coordinate scheduling, submittals, and work of the various Sections of Contract Documents to ensure the efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.

F. Coordinate the sequence of Work to accommodate the Owner occupancy as specified in the Contract Documents.

G. In addition to Progress Meetings specified in Section 01320, Progress Schedule, hold pre-construction conferences with personnel and Subcontractors to ensure coordination of Work. The Engineer shall be informed of such meetings and shall be allowed to attend.

H. Coordinate the Work of various sections having interdependent responsibilities for installing equipment, connecting equipment, and placing such equipment in service.

I. Coordinate the use of project space and the sequence of installing civil, mechanical, structural, instrumentation, systems, and electrical work. Follow practicable routings for pipes, ducts, and conduits, with due allowance for available physical space; make runs parallel with lines of building. Use space efficiently to maximize accessibility for other installations, maintenance, and repairs.

J. Coordinate Work at existing facilities to minimize disruption of the Owner's operations.

K. Assemble and coordinate close-out submittals specified in Section 01770, Project Closeout.

1.07 COORDINATION DRAWINGS

A. The Contractor shall provide information required by the Engineer for preparing coordination drawings.

B. The Contractor shall review drawings before submitting them to the Engineer.

1.08 CLOSE-OUT PROCEDURES

The Contractor shall do the following:

A. Notify the Owner when Work is considered ready for Substantial Completion.

B. Comply with the Owner's instructions to correct items of Work listed in executed Certificates of Substantial Completion.

C. Notify the Owner when Work has reached Final Completion.

D. Comply with the Owner's instructions for completing items of Work found incomplete in the Engineer's final inspection.

E. Comply with Section 01770, Project Closeout.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. All vehicles on the property or easement must be operational.

3.02 UTILITIES

A. The Contractor shall coordinate the activities of all utility companies with equipment in the construction area with the Contractor's and Subcontractor's Work.

3.03 CUTTING AND PATCHING

A. No cutting and patching of new Work will be accepted. All Work must be new and continuous in its final form.

END OF SECTION

SECTION 01320
PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. All work of this Contract shall be scheduled and monitored by the Contractor using the Critical Path Method (CPM) and shall use the Precedence Diagram Method (PDM) of scheduling. The Contractor shall prepare all schedules and all monthly updates described in this Section. The Contractor will prepare revisions of the schedule to reflect changes in the Contractor's plan of performance or changes in the Work and submit these revisions to the Engineer for acceptance. The Engineer's acceptance of the scheduling documents is to ensure that all CPM Scheduling documents prepared by the Contractor are in conformance with the Contract Documents and Specifications described herein. This acceptance will not impose on the Engineer or Owner the responsibility for the schedule or for the sequencing, scheduling, or progress of the Work, nor will the acceptance interfere with or relieve the Contractor of full responsibility for the schedule and the means, methods, procedures, and sequence of construction.

B. The Contractor shall use the latest version of Primavera Scheduling software, or an approved equal, for all CPM Scheduling applications.

C. The Engineer or Owner may retain the professional services of a CPM Scheduling Consultant to assist in the review and acceptance of the CPM Scheduling documents prepared by the Contractor. Therefore, any reference to the Engineer or Owner within this Section may also indicate the involvement of the Engineer's or Owner's CPM Scheduling Consultant.

D. The Contractor shall prepare and maintain a detailed progress schedule throughout the construction of the Project. The schedule shall be the Contractor's working schedule and be used to plan, organize, and execute the Work, record and report actual performance and progress, and show how the Contractor plans to complete the Work. The schedule will be in the form of an activity-oriented network diagram (CPM).

E. When the Contractor prepares the CPM Schedule and the schedule is accepted by the Engineer, it shall become part of the Contract Documents and will be used by Contractor and Engineer to monitor the progress of the Project. The CPM Schedule may be revised to show changes in the Contractor's method or manner of performance; delays, or authorized changes in the Work. All changes to the schedule will be made in accordance with Article 1.07 of this Section.

F. The Contractor acknowledges that free float belongs to the Owner.

1.02 PRELIMINARY 90-DAY CPM SCHEDULE

A. The Contractor shall develop a 90-Day CPM Schedule within 10 days after the date indicated in the Notice to Proceed. This schedule shall be a computerized CPM Schedule showing only the early start, early finish of each work activity. The 90-Day Schedule shall contain work activities over the first 90 days, and the estimated durations for each work activity shall be 15 workdays or less. The balance of the job shall be shown in summary log. The 90-Day Schedule shall include but not be limited to site work, hazardous material removal, demolition, key procurement activities (i.e. submissions, approvals, fabrication, and delivery), equipment, mechanical, electrical, and plumbing coordination and any other work that will occur during the first 90 days. This 90-Day Schedule shall become part of the Detailed CPM Schedule.

1.03 DEFINITIONS

The following terms used in this Section shall have the following meanings:

A. *Activity.* A fundamental unit of work in a CPM Schedule establishing the time and resources required for performing or furnishing a part of the Work or a requisite step. Each Activity has defined geographical boundaries, time duration in days, and a detailed estimate of resources required to construct the task. Each activity is assigned a unique description, activity number, activity code, and a dollar value.

B. *Record Schedule.* The Record Schedule will have actual start dates and actual finish dates for all work Activities and Milestones necessary to complete the Work.

C. *Baseline Schedule.* The Engineer-accepted Proposed Baseline Schedule. The Baseline Schedule is the Contractor's plan which has been approved by the Engineer for completion of the Work in compliance with the Milestones listed in the Contract Documents and within the Contract Time. The Baseline Schedule may be revised only by the Engineer's approval of a Contractor-produced adjusted Baseline Schedule. The Baseline Schedule for the Work is the sole basis for (a) the monitoring of the Contractor's progress against Milestones and the Contract Time; (b) calculating Total Float or Contract Float; and (c) the evaluation and reconciliation of extensions in Contract Time, if any. The first Baseline Schedule shall be designated by all parties as the Baseline Schedule, Rev. 0. When Baseline Schedules are adjusted by the Contractor and approved by the Engineer, they shall be designated as Baseline Schedule, Rev. 1, 2, 3, etc. (as appropriate) and shall replace the previously approved Baseline Schedule.

D. *Contract Float.* Workdays between the Contractor's expected date for early completion of the Work, or specified part, and the corresponding Contract Time.

E. *CPM Network.* The structure of the computerized schedule. The CPM Network accounts for the entire Work and defines the construction logic in terms of all of the Activities with their logical dependencies.

F. *Critical Path.* A series of Activities linked by dependencies that determine the shortest possible time to complete the Work.

G. *Early Dates.* The early start dates and early finish dates, i.e., the dates each Activity will start and finish if each is started at the earliest end of the range of dates that the CPM indicates the Activities can be performed.

H. *Excusable Delay.* An unforeseeable delay, beyond the control of the Contractor, experienced due to no fault or negligence by the Contractor, its subcontractors, or suppliers.

I. *Free Float.* The amount of time that any activity can be delayed without adversely affecting the early start of the following activity.

J. *Fragnet.* A predefined or individual segment of a network which represents a specified sequence of the Work. Fragnets shall be submitted which include all Activities, required resources, and costs and shall be submitted to the Engineer for approval of all Change Orders before their incorporation into the Baseline Schedule by the Contractor. A Fragnet shall be submitted before approval of any proposed logic changes. Fragnets are banded Activities representing a revised portion of the Baseline Schedule and shall be logically connected and constrained by previously existing predecessor and successor Activities, as applicable.

K. *Late Dates.* The late start dates and the late finish dates; i.e., the dates each Activity will start and finish if each is started at the latest end of the range of dates that the CPM Network indicates the Activities can be performed and still achieve the Milestones and Contract Time.

L. *Milestone.* A point of progress designated for the purpose of establishing start or finish times for a key aspect of the Work.

M. *Predecessor Activity.* An Activity which precedes another Activity (to which it is logically tied) in the CPM Network.

N. *Preliminary Schedule*. The Contractor's Baseline Schedule for the first 180 days of the Contract.

O. *Proposed Baseline Schedule.* The Proposed Baseline Schedule shall represent the Contractor's plan for completion of the Work in compliance with Milestones listed in the Contract Documents and within the Contract Time. It represents the Contractor's first complete planned schedule submitted for review and approval by the Engineer. The Proposed Baseline Schedule shall take into account all foreseeable activities to be accomplished by any separate contractors, utility owners, or the Owner's operations. The Proposed Baseline Schedule shall anticipate all necessary manpower and resources to accomplish activities within the durations set forth in the Proposed Baseline Schedule. The Proposed Baseline Schedule shall address and indicate all submittals required by the Contract and indicate the times allowed for review, resubmittal, and approval of submittals. Upon approval by the Engineer, the first Proposed Baseline Schedule shall become the Baseline Schedule, Rev. 0.

P. *Resource Loading.* The allocation of work force and equipment necessary for the completion of an Activity as scheduled.

Q. *Six-Week Schedule.* A detailed progress schedule taken from the Working Schedule, which discloses the plan for the next 6 weeks' Work and the actual schedule for the previous 6 weeks' Work.

R. *Successor Activity.* An Activity which follows another Activity (to which it is logically tied) in the CPM Network.

S. *Total Float.* The number of workdays by which a part of the Work in the Baseline Schedule or Revised Baseline Schedule may be delayed from its Early Dates without necessarily extending the Contract Time.

T. *Working Schedule.* When the Proposed Baseline Schedule (or a subsequent adjustment is made by the Contractor to the Baseline Schedule) is accepted by the Engineer and becomes the Baseline Schedule, Rev. 0, 1, 2, 3, etc., it shall be duplicated and become the Working Schedule. The Contractor shall update the Working Schedule monthly with a Data Date designated by the Engineer. The Working Schedule shall be updated monthly to reflect actual progress only and shall be the basis for determining monthly progress payments and the Contractor's performance in relation to the most recently approved Baseline Schedule. The Final Working Schedule shall be the Record Schedule.

1.04 DETAILED CPM SCHEDULE

A. The Detailed Network Diagram shall provide sufficient detail and clarity of form and technique so that the Contractor can plan, schedule, and control his work properly and the Engineer can readily monitor and follow the progress for all

portions of the Work. The Detailed Network Diagram shall comply with the Contract Times of the Agreement and various limits imposed by the Contract Documents, including required sequencing of portions of the Work described in Section 01100, Summary of Work. The degree of detail shall be to the satisfaction of the Engineer, but the following factors shall have a bearing on the required depth of activity detail:

1. The structural breakdown of the Project.
2. Project Phasing and/or Milestones.
3. The type of work to be performed and the labor trades involved.
4. All purchase, manufacture, and delivery activities for all major materials and equipment.
5. Maintenance of Facilities in Operation.
6. Submittal and approval of shop drawings and material samples.
7. Plans for all subcontract work.
8. Crew flows and sizes.
9. Assignment of responsibility for performing all activities.
10. Access and availability to work areas.
11. Identification of interfaces and dependencies with preceding, concurrent, and follow-on subcontractors and contractors.
12. Testing and start-up of systems.
13. Planning for phased takeover by the Owner.

B. Activities shown shall be in workdays and shall have a maximum duration of 5 days, except in the case of non-construction activities such as procurement of materials and delivery of equipment. All durations shall be the result of definitive manpower and resource planning by the Contractor.

C. The Detailed Network Diagram shall be prepared using a computer plotter.

1.05 COMPUTERIZATION OF THE DETAILED CPM SCHEDULE

A. The mathematical analysis of the Detailed Network Diagram shall be made by computer, and a tabulation for each activity shall include the following:

1. Unique event numbers.
2. Activity descriptions.
3. Durations in workdays for each activity.
4. Earliest start date (by calendar date).
5. Earliest finish date (by calendar date).
6. Latest start day (by calendar date).
7. Latest finish day (by calendar date).
8. Slack or total float in workdays.
9. Percentage of activity completed.

B. The following computer outputs shall be prepared as part of the initial schedule submission and each update thereafter:

1. Activity file sort.
2. Eight-week “Look Ahead” detailed bar chart.
3. Summary bar chart.
4. Additional computer sorts to the schedule as required by the Owner.

1.06 COMPLETION REQUIREMENT

A. The 90-Day Schedule shall be completed within 10 calendar days after the date indicated in the Notice to Proceed.

B. The Detailed CPM Schedule shall be prepared within 30 calendar days after the date indicated in the Notice to Proceed.

C. If the Contractor fails to provide the required CPM scheduling documents to the Engineer within the time prescribed and/or revisions of the scheduling documents within the required time, the Contractor shall be in default of the Contract requirements and the Engineer may withhold approval of progress payments until such time as the Contractor submits the required information.

D. Notwithstanding the implementation of the Progress Schedule, it shall be the sole responsibility of the Contractor to complete the Work within the time of completion required by the Contract.

1.07 UPDATINGS

A. The 90-Day CPM Schedule shall be updated monthly until the Engineer accepts the Detailed CPM Schedule.

B. The first update of the Detailed CPM Schedule shall take place 60 calendar days after the Notice to Proceed with subsequent updates performed monthly at the jobsite for the duration of the Contract.

C. The Contractor shall update the Detailed CPM Schedule monthly, using a cutoff/data date agreeable to the Contractor and the Engineer. This cutoff/data date shall be consistent from month to month. The update information shall include but not be limited to the following:

1. Actual start dates.
2. Actual completion dates.

3. Activity percent completion.
4. Remaining duration of activities in progress.

D. The Contractor shall update all the scheduling documents and submit these documents to the Engineer within 5 workdays of the cutoff/data date.

E. The Contractor shall submit seven copies of the CPM schedule and one electronic copy of the CPM schedule on a CD.

F. As part of the normal CPM update, the Contractor shall prepare a written narrative report highlighting the progress during the past update period. The written narrative report shall include but not be limited to the following information:

1. Summary of work accomplished during the past update period.
2. Milestone Comparison Chart.
3. Analysis of Critical Path(s).
4. Analysis of Secondary Critical Path(s). Secondary Critical Path is defined as float within 10 workdays of Critical Path.
5. Analysis of time lost/gained during the update period.
6. Identification of problem areas.
7. Identification of change orders and/or any delay that is impacting/delaying the project schedule.
8. Solutions to current problems.

G. The Contractor is required to attend and participate in a CPM update review meeting with the Engineer. Attendance is mandatory. This meeting will take place 7 workdays after the cutoff/data date, or during progress meetings as decided by the Owner and the Engineer. The purpose of this meeting is to review past progress, current status, problem areas, and future progress. The Contractor's narrative report will be reviewed at this meeting.

H. All schedule update information outlined above will be reviewed and accepted by the Engineer.

1.08 RECOVERY SCHEDULE

A. If the Contractor fails to achieve the planned progress, as indicated in the approved/updated detailed CPM Schedule, and the Contractor's lack of progress delays the Critical path and/or an intermediate milestone by more than 10 workdays (monthly or cumulatively), the Contractor shall submit to the Engineer for review and acceptance a proposed Recovery Schedule indicating how the Contractor will recover the time lost.

B. If the Contractor fails to submit a Recovery Schedule and/or fails to cooperate with the Engineer in the Recovery Schedule process, the Owner can immediately order the Contractor to accelerate completion of the late activities which have been delayed by whatever means necessary without any additional costs to the Owner. The Owner can withhold future progress payments until the Contractor's progress is in compliance with the Contract Schedule or until the Owner has approved by Change Order proposed adjustments to the contract milestones, extension of contract time, or modification of the Contract Schedule.

1.09 CHANGE ORDERS, DELAYS, AND EXTENSIONS OF TIME

A. When proposed Change Orders, approved Change Orders, or any delays are experienced and the Contractor believes the Change Order/Delay is causing delay to an intermediate contract milestone or to the project completion, the Contractor shall submit to the Engineer a Time Impact Analysis, explaining the influence of each Change Order/Delay on the current updated Contract CPM Schedule. The Contractor shall prepare a "Fragnet" (network analysis) of each Change Order/Delay on the current updated Contract CPM Schedule. The analysis will demonstrate the time impact based on the date the change is given to the Contractor, the status of construction at that point in time, and the event time computation of all affected activities. The event times used in the analysis shall be those included in the latest updated copy of the detailed CPM Schedule closest to the time of delay or as accepted by the Engineer.

B. For the Contractor to be entitled to an extension of Contract time to an intermediate contract milestone and/or to the project completion, the Time Impact Analysis must show that the Change Order/Delay impacts the intermediate contractual milestone date and/or the updated CPM Schedule's Critical Path, thereby directly impacting the project completion date. Change Orders/Delays that do not impact intermediate contractual milestones and/or the critical path and impact activities with float will not be considered as a delay to the project and no extension of time will be granted.

C. The Contractor must submit a written analysis within 7 calendar days after a delay occurs or authorized change in work is given to the Contractor. If the Contractor does not submit a written analysis for specific Change Order(s) or Delay(s) within the specified period of time, then it is mutually agreed that the particular Change Order of Delay has no time impact on the Project CPM Schedule and no time extension is required.

D. The Engineer will accept or reject each Time Impact Analysis within 14 calendar days after submittal unless subsequent meetings and negotiations are necessary. Upon the Engineer's acceptance, the Contractor will incorporate fragnets

illustrating the influence of the Change Orders and Delays into the Detailed CPM Schedule during the first update after agreement is reached.

1.10 PROGRESS MEETINGS

A. The Owner will conduct progress meetings at least once per month to discuss the progress of the Work. The Contractor and any subcontractors the Contractor deems necessary shall attend these meetings. At the Owner's discretion, the frequency of the meetings may be increased if the progress of the Work is not satisfactory or if coordination problems should arise.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01325
CONSTRUCTION PHOTOGRAPHS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall have digital pictures, photographs, and DVDs made of the Work from views and at such times as directed by the Engineer. These photographs shall represent a visual history of the Project, from Contract Award through Contract Completion.

B. The Contractor shall take a preconstruction video of the entire site, including the areas of adjacent properties within 100 feet of the limit of Work. Special effort shall be made to show the existing paved roads, shoulders, signs, and other existing features.

C. The Contractor shall also use electronic "snap-shot" photography as necessary to record and facilitate resolution of on-site issues through the transmission of electronic photographs by e-mail from the site to the Engineer's and Owner's offices.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS

2.01 PRODUCTS

A. Photographs and digital pictures shall be in color. Provide one copy of each digital picture on each of three CDs.

B. Provide photographs taken of each of the major items during construction.

C. View and Quantities Required: A minimum of 30 images per month clearly showing project status and key elements of construction.

D. Deliver electronic images supplied on USB storage media to the Engineer with every pay request.

PART 3 EXECUTION

3.01 VIEWS REQUIRED

A. Photographs shall be from locations to illustrate the condition of construction and the state of progress adequately.

B. The Contractor shall provide before and after photographs of each portion of the site. The below-ground facilities shall include all equipment, walls, floor, piping, supports, and entrance. At major locations photographs shall include before, during, and after photographs and all photographs shall be organized by ascending date order to show the Work as it progresses.

3.02 DESCRIPTIVE INFORMATION

A. Each photograph shall have a permanent title block on the back and shall contain the typed information and arrangement as follows:

COMPLETE PROJECT NAME
Contract No.

CONTRACTOR:	(Name of Contractor)
DATE:	(When Photo was Taken)
PHOTO NO.:	(Consecutive Numbers)
PHOTO BY:	(Firm Name of Photographer)
LOCATION:	(Description of Location and View)

B. The Contractor shall provide the Engineer with a written description of each photograph. This description shall be included in the binders and a copy shall be submitted with the CDs. The Field Engineer or inspector shall approve the description.

3.03 VIDEOTAPE REQUIREMENTS

A. Major Locations

1. The Contractor shall provide color digital video of each major facility and structures and facilities adjacent to the construction before construction starts, during construction, and when construction has been completed.

Approximately every 2 weeks, 15 minutes of digital video shall be submitted to the Engineer showing Work completed, Work in progress, Work started, and problems which occurred since the last taping. The Contractor shall maintain the master video CD ROM of each portion of the facility on the Work site. The master video shall be a running chronicle of construction progress. The Contractor shall combine the bi-weekly video onto the master video. The bi-weekly video shall be submitted to the Engineer within 10 working days after recording and the bi-weekly videos may include multiple locations.

2. All videos shall be recorded with character generator operating with date, time, and location on screen. During video recording, the Contractor shall narrate the video, explaining what is being shown, the problem that has occurred, and what is being done. All videos shall be delivered to the Engineer before Final Completion is submitted.

3.04 DIGITAL PHOTO DOCUMENTATION

A. Catalog and manage Electronic “snap-shots” and images of photographs in a secure digital photo management system capable of being linked to the project schedule and document management database. Add captions, descriptions, and key words. Transfer a copy of all “snap-shots” and photos with their related notes, keywords, captions, and activity IDs to the Engineer weekly.

B. All photographs shall be clear, sharp, and free of distortion after enlargement. Each photograph shall have a permanent title block in the lower right-hand corner which shall be 2 1/2 inches high by 6 inches wide and shall contain the information and arrangement as described in Paragraph 3.02.A above.

END OF SECTION

SECTION 01330
SUBMITTALS AND ACCEPTANCE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall submit documentation that describes the Work to be performed under the Contract as required in this Section. This documentation will be for the Engineer and Owner's review and use. The documentation furnished by the Contractor must enable the Engineer and Owner to verify the Contractor's performance and compliance with Contract requirements. The documentation shall cover all services and deliverables required and secured by the Contract Documents.

1.02 SUBMITTALS

A. General—The Contractor shall submit the following:

1. Project documentation: For the Engineer and Owner's internal use and shall include all information that will be essential for the facility's operations, maintenance, training, and repair of equipment and facilities supplied by the Contractor. The Contractor shall submit all documentation necessary to ascertain compliance with technical/contractual provisions.

2. Shop drawings: Drawings, schedules, diagrams, warranties, and other data prepared specifically for this Contract by the Contractor or through the Contractor by way of subcontractor, manufacturer, supplier, distributor, or other lower-tier contractor to illustrate a portion of the Work.

3. Product data: Preprinted materials such as illustrations, standard schedules, performance charts, instructions, brochures, diagrams, manufacturer's descriptive literature, catalog data, and other data to illustrate a portion of the Work, but not prepared exclusively for this Contract.

4. Samples: Physical examples of products, materials, equipment, assemblies, or workmanship that are physically identical to portions of the Work, illustrating portions of work, or establishing standards for evaluating appearance of finished work or both.

5. Administrative submittals: Data presented for reviews and acceptance to ensure that administrative requirements of the project are adequately met

but not to ensure directly that work is in accordance with the design concept and in compliance with Contract Documents.

6. Mockups: Before installing work requiring mockups, the Contractor shall build mockups for each form of construction and finish required using materials indicated for the completed Work, as follows:

    a. Build mockups in the location and of the size directed by the Engineer.
    b. Notify the Engineer 7 days in advance of dates and times when mockups will be constructed.
    c. Demonstrate the proposed range of aesthetic effects and workmanship.
    d. Obtain the Engineer’s acceptance of mockups before starting work, fabrication, or construction.
    e. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
    f. Demolish and remove mockups when directed by the Engineer.

B. Coordination

1. Submittals and schedules shall be checked and coordinated with the Work of all trades involved before they are submitted and shall bear the Contractor's stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the Contractor for resubmission.

C. Start of Work

1. Within 30 calendar days after the notice to proceed for the project, the Contractor shall submit to the Engineer a Contract Data Requirements List that defines all data to be submitted under this Contract. Included in this list shall be the names of all proposed manufacturers furnishing specified items to the extent known. Review of this list by the Engineer shall in no way relieve the Contractor from providing materials, equipment, systems, and structures fully in accordance with the Specifications.

D. General Requirements

1. The Contractor shall prepare, assemble, and submit all documents as described herein. The Contractor shall submit certification that the documents prepared conform to the Contract requirements and will result in a complete and operable project. The Engineer and Owner shall review

the Contractor's documents for conformance to the Contract requirements and may comment on the documents.

2. The Contractor shall approve and certify all project documents. The Contractor's failure to certify the documents or failure to provide documents that demonstrate conformance to the Contract requirements are grounds for rejection. The Contractor shall be responsible for and bear all costs for proceeding with any part of the Work that fails to meet the Contract requirements.
3. Submittal of documents for the Engineer's review shall in no way relieve the Contractor of full responsibility for providing a complete, safe, reliable, operating, and coordinated Work (system/equipment/facilities) that is in compliance with these Contract documents.

E. Requests for Substitution

1. All requests for substitution shall clearly and specifically indicate any and all differences or omissions between the products specified as basis of design and the product proposed for substitution. Data shall include but not be limited to differences as follows for both the specified and substituted products:

    a. Principle of operation.
    b. Materials of construction or finishes.
    c. Thickness or gauge of materials.
    d. Weight of item.
    e. Deleted features or items.
    f. Added features or items.
    g. Changes in other work caused by the substitution.
    h. If the substitution contains differences or omissions not specifically called to the attention of the Engineer, the Engineer reserves the right to require equal or similar features to be added to the substituted product at the Contractor's expense.

F. Submittal Requirements and Procedures

1. Drawing Formats and Requirements

    a. Drawings—All Drawings and Shop Drawings shall be prepared on 22-x-34-inch paper and shall have a blank area of 3 x 4 inches in the lower right hand corner above the title block. Each Drawing shall indicate the following information in the title block:

        (1) Title and Drawing Number.
        (2) Date of Drawing or Revision.

(3) Name of Building or Facility.
(4) Name of Contractor or subcontractor.
(5) Drawing contents and locations.
(6) Specification Section and Subsection Numbers.

b. Required Copies—All drawings submitted shall have a minimum of eight copies distributed in the following way:

(1) 2—Owner.
(2) 4—Jones Edmunds.
(3) 2—Returned.

2. Product Data

a. Requirements—Product data shall include all catalog cuts, performance surveys, test reports, equipment lists, material lists, diagrams, pictures, and descriptive material. All product data shall be submitted on either 8.5-x-11-inch or folded 11-x-17-inch size paper of 20-lb (9.072 kg) weight. The submittal information shall show the standard and optional product features, as well as all performance data and specifications. The manufacturer's recommendation for special tools shall be supplied.

3. Samples—The Contractor shall furnish samples required by the Contract Documents, for review by the Engineer. Samples shall be delivered to the Engineer as specified or directed.

a. All samples shall be of sufficient size and quantity to illustrate clearly the functional characteristics of the product, with integrally related parts and attachment devices. The samples shall show the full range of color, texture, and pattern.
b. The Contractor shall submit a minimum of four samples of items submitted. All samples shall be marked with required submittal information, as specified above.

4. Color, Texture, and Pattern Charts

a. The Contractor shall submit color, texture, or pattern charts of all required finishes.
b. A minimum of four charts of each item shall be submitted.

5. Submittal Information Requirements

a. When used in the Contract Documents, the term "Submittal Information" shall be considered to mean the following information at a minimum:

(1) Contract Name.
(2) Contract Number.
(3) Location within Facility.
(4) Date Submitted.

b. Drawings—The Contractor shall mark submittal information on all Drawings in the left half of the 4-x-3-inch block as described above.

c. Product Data and Manufacturer's Literature—The Contractor shall mark all product data and manufacturer's literature with submittal information and note which item is being furnished. The Contractor shall mark the option and supplies to be furnished with the item. At least one original manufacturer product data sheet must be submitted; the balance can be copied. Do not submit the manufacturer's general catalog: submit only items being installed or delivered. When manuals are being submitted, the Contractor shall mark submittal information on both the cover and title page. If manuals being submitted contain more than just one item, each item must be marked and only Contract name and number is to be marked on the cover and title page.

6. Training, Operation and Maintenance Manuals

a. The Contractor shall submit to the Engineer for review and acceptance of manufacturer's installation, operations, lubrication, maintenance, and training manuals for all equipment installed or delivered under this Contract. All manuals shall have submittal information marked on the front cover, title page, and three places inside the manual. If the manual being submitted is for different components, mark the front cover and title page only. Each component section must be marked with the Specification Section and subsection numbers. Operations and Maintenance Manuals shall conform to requirements defined in Section 01830, Operations and Maintenance Manuals.

G. Required Submittals

1. Structural Submittals

a. This Section specifies general procedural requirements for contractual submittals for the following structural schedules, product data, samples, and manufacturer's certificates.

(1) Product Data—The Contractor shall provide product data for all structural items, options, and other data and provide supplemental manufacturer's standard data for information unique to the Work and installation. The submittals shall reflect all items delivered or installed under this Contract.
(2) Samples—The Contractor shall provide all samples required under this Specification including color charts and product samples.
(3) Material, equipment, and installation and demolition Specifications.

2. Mechanical and Electrical System Submittals

a. This Section specifies general procedural requirements for mechanical schedules, performance data, control diagrams, and other submittal data.

b. The Contractor shall submit the following:

(1) Performance Data.

(2) Power and Riser Diagrams—Single line riser, power diagrams, and all conduit runs shall be provided for all equipment and facilities.

(3) Wiring Diagrams—Elementary controls diagrams and separate wiring diagrams for mechanical and electrical unit/subsystem. Drawing for starting and shutdown of equipment including controls shall be provided, including a comprehensive description of operation.

(4) Finished Data—Complete surface preparation and finished data for all mechanical and electrical unit/subsystems shall be provided, including a complete list of cleaning instructions.

(5) Factory Testing—Detailed description of factory testing procedures, reporting procedures and criteria for test passing or failing shall be provided for all mechanical and electrical units/subsystems. Testing shall comply with the General Requirements and Technical Requirements Sections.

(6) Site (Field) Testing and Acceptance—Detailed description of site testing and acceptance tests including descriptions of procedures, testing equipment, reporting procedures, and criteria for passing or failing tests shall be provided for all mechanical and electrical units/subsystems. Testing shall comply with General Requirements and Technical Requirements.

(7) Factory Test Report—After fabrication and testing, the Contractor shall submit the results of tests. No shipment of any mechanical and electrical unit/subsystem shall be allowed without the written certification from the Contractor that the equipment conforms to the Contract requirements.

(8) Site Test and Acceptance Report—Site test and acceptance reports shall be submitted to the Owner and Engineer.

(9) Operations and Maintenance Manuals—The Contractor shall furnish manuals for all mechanical and electrical equipment specified under this Contract. Each manual shall include the following at a minimum:

(a) Description of equipment.
(b) Record shop drawing.
(c) Operation and maintenance instructions.
(d) Part lists.
(e) Equipment ratings.
(f) Valve list.
(g) Lubrication instructions.

c. Compliance with this Section does not relieve the Contractor from compliance with the requirements of Section 01830, Operations and Maintenance Manuals.

H. Submittal Review

1. The Engineer's review of the Contractor's documents shall not relieve the Contractor of the responsibility for meeting all of the requirements of the Contract nor of the responsibility for correcting the documents furnished. The Contractor shall have no claim for additional cost or extension in time because of delays due to revisions of the documents that may be necessary for ensuring compliance with the Contract.

2. The Engineer will review a submittal or re-submittal once, after which the cost of review shall be borne by the Contractor. The cost of Engineering shall be equal to the Engineer's full cost.

3. No partial submittals will be reviewed. A submittal or re-submittal not complete will be returned to the Contractor for completing and re-submittal.

4. Documents submitted by the Contractor for approval by the Engineer will be returned bearing a project-specific stamp bearing the dated signature of the reviewer and one of four boxes checked:

   a. NO EXCEPTIONS NOTED—This indicates that the submittal appears to be in compliance with the requirements of the performance specifications and that the Work may proceed.
   b. MAKE CORRECTIONS NOTED—This indicates that the reviewer has added a minor correction to the submission and that the Work (modified in accordance with the correction comment) may proceed. The Contractor shall accept the responsibility of the modified document and resulting Work with no additional compensation.
   c. AMEND AND RESUBMIT—This indicates that the submittal will require Contractor modifications based on the reviewer's comments that accompanied the returned submittal. The Contractor will be cautioned that work may not proceed under this review status.
   d. REJECTED—This indicates that the submittal is not in conformance with the requirements of the performance Specifications and cannot be modified to gain compliance. A new submittal will be required in the instance of a "reject" status and the Contractor will be cautioned that work may not proceed under this condition.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 SUBMITTAL PROCEDURES

A. Before submitting documents for the Engineer's review, the Contractor shall review the documentation for conformance to the Contract requirements. Submittals shall be complete and comprise a logical division of the Contract Work.

B. All documentation submitted by the Contractor to the Engineer shall be accompanied by a letter of transmittal and shall be submitted in a sequence that allows the Engineer to have all of the information necessary for checking and accepting a particular document at the time of submittal.

C. Each document shall be identified by a document number, Contract number, Contract name, location, Specification Section, subsection numbers, and submittal date. Where a manual/drawing is revised to reflect a change in design or a change for any other reason, each such revision shall be shown by a revision number, date, and subject in a revision block. Indication of official approval by the Contractor's Project Manager shall also be included. To permit rapid location of the revision, additional notation shall be made in the manual opposite the line or area where the change was made and identified by the corresponding revision number.

3.02 DOCUMENTATION CONTROL AND SUBMITTAL SEQUENCING

A. The Contract Data Requirements List shall be updated and resubmitted to the Engineer monthly, throughout the duration of the Contract. This list shall identify the Contractor's submittal number, proposed and actual submittal date, Contract Specification Section Number, Paragraph, Item of the Work, and type of document.

B. The Contractor shall work with the Engineer to provide a regulated flow of submittals that allows the Engineer to review the submittals in the defined time frame without undue delays. Monthly the Contractor shall provide the Engineer a schedule of the approximate quantities and delivery dates for all submittals due for the next 120 days.

3.03 FINAL RECORD DRAWINGS

A. The Contractor shall submit the Final Record Drawing Package to the Engineer for review at Substantial Completion. The Contractor shall be provided with CADD files, AutoCAD in the version specified by the Engineer. Final Record Drawings shall be printed on 22-x-34-inch sheets and on CDs, in AutoCAD. The Contractor may request to use a different version, but it must be approved by the Engineer. Record Drawings shall be in accordance with Section 01785, Record Documents.

3.04 REQUIREMENTS FOR SUBMITTAL

A. Additional documents, drawings, interface data, and other pertinent project submittal data are listed in specific sections of this Contract.

3.05 RECORD PRINTS

A. The Contractor shall submit one set of all record prints before final completion. The record print or project records shall include submittals, catalog cuts, drawings, calculations, test reports, manufacturer's data, maintenance manuals, installation instructions, and operating manuals. All "record prints" shall be delivered to the Engineer in three-ring binders with dividers and shall be placed in order by Specification Section.

END OF SECTION

SECTION 01350
ENVIRONMENTAL PROTECTION PROCEDURES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Work covered by this Section consists of furnishing all labor, materials, and equipment and performing all work required for the prevention of environmental pollution in conformance with applicable laws and regulations during and as the result of construction operations under this Contract. In this Section *environmental pollution* is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare, unfavorably alter ecological balances of importance to human life, affect other species of importance to man, or degrade the utility of the environment for aesthetic and/or recreational purposes.

B. The control of environmental pollution requires considering air, water, and land and involves managing noise and solid waste as well as other pollutants.

C. The Contractor shall schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the Work. The Contractor shall provide erosion-control measures such as diversion channels, sedimentation or filtration systems, berms, staked synthetic bales, seeding, mulching or other special surface treatments that are required to prevent silting and muddying of streams, rivers, impoundments, lakes, etc. All erosion-control measures shall be in place in an area before any construction activity in that area.

D. This Section is intended to ensure that construction is achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings. These are general guidelines. It is the Contractor's responsibility to determine the specific construction techniques to meet these guidelines.

E. All phases of sedimentation and erosion control shall comply with and be subject to the laws of the State of Florida and the Project Environmental Resource Permit.

1.02 SUBMITTALS

A. The Contractor shall prepare a sedimentation and erosion-control drawing meeting the requirements of the law and furnish two copies of the approved Drawing to the Engineer.

1.03 WORK SEQUENCE

A. Before beginning the Work, the Contractor shall meet with the Engineer to establish agreed-upon compliance with these provisions and administration of the environmental pollution control program.

B. The Contractor shall remove temporary environmental control features when approved by the Engineer and incorporate permanent control features into the project at the earliest practicable time.

1.04 REFERENCE STANDARDS

A. Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. Where this Section differs from these documents, the requirements of this Section shall apply.

B. The Contractor shall comply with all applicable Federal, State, and local laws and regulations concerning environmental pollution control and abatement.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EROSION CONTROL

A. The Contractor shall provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion-control measures, such as siltation basins, check dams, mulching, jute netting, and other equivalent techniques shall be used as appropriate. Surface water shall be prevented from flowing into excavated areas. Ditches shall be used around the construction area to carry away water resulting from dewatering excavated areas. At the completion

of the Work, ditches shall be backfilled and the ground surface restored to its original condition.

3.02 PROTECTION OF STREAMS AND SURFACE WATERS

A. Care shall be taken to prevent or reduce to a minimum any damage to any stream or surface water from pollution by debris, sediment, or other material or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing or that contains oils or sediments that will reduce the quality of the water in the stream shall not be directly returned to the stream. Such waters shall be diverted through a settling basin or filter before being directed into streams or surface waters.

B. The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water, or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.

C. All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action plan approved by the Florida Department of Environmental Protection and the US Environmental Protection Agency. The Contractor shall submit two copies of approved contingency plans to the Engineer.

D. Water being flushed from structures or pipelines after disinfection with Cl_2 shall be treated with a dechlorination solution approved by the Engineer before discharge.

3.03 PROTECTION OF LAND RESOURCES

A. After completion of construction, the Contractor shall restore land resources within the project boundaries and outside the limits of permanent work to a condition that will appear to be natural and not detract from the appearance of the project. All construction activities shall be confined to areas shown on the Drawings.

B. Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, the Contractor shall first wrap the trunk with a sufficient thickness of burlap or rags over which

softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.

C. The Contractor shall protect trees that may possibly be defaced, bruised, injured, or otherwise damaged by the construction equipment, dumping, or other operations by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly.

D. Any trees or other landscape features scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to their original condition. The Owner will decide the method of restoration to be used and whether damaged trees shall be treated and healed or removed and disposed of.

1. All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 1inch in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.
2. Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and, in the opinion of the Owner, are beyond saving shall be immediately removed and replaced.

E. The Contractor’s storage and other construction buildings required temporarily in the performance of the work shall be located in cleared portions of the job site or areas to be cleared as shown on the Drawings and approved by the Engineer and shall not be within wetlands or floodplains. Preserving the landscape shall be required in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for the Engineer’s approval.

F. If the Contractor proposes to construct temporary roads or embankments and excavations for plant and/or work areas, the Contractor shall submit the following for approval at least 10 days before the scheduled start of such temporary work:

1. A layout of all temporary roads, excavations, embankments, and drainage to be constructed within the work area.
2. Details of temporary road construction.
3. Drawings and cross-sections of proposed embankments and their foundations, including a description of proposed materials.
4. Landscaping drawings showing the proposed restoration of the area. The proposed removal of any trees and shrubs outside the limits of the existing clearing area must be indicated. Locations of guard posts or barriers required to control vehicular traffic and protect trees and shrubs to be

maintained undamaged must also be indicated. The drawings shall provide for the obliteration of construction scars as such and shall provide for a natural appearing final condition of the area. Modification of the Contractor's approved drawings shall be made only with the written approval of the Engineer. No unauthorized road construction, excavation, or embankment construction including disposal areas will be permitted.

G. The Contractor shall remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling, and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation within the roadway areas. The disturbed areas shall be prepared and seeded as approved by the Engineer or Owner.

H. All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.

3.04 PROTECTION OF AIR QUALITY

A. Burning—Burning will not be permitted at the project site for the disposal of refuse and debris.

B. Dust Control—The Contractor shall maintain all excavations, embankment, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or outside the project boundaries free from dust which could cause the standards for air pollution to be exceeded and which would cause a hazard or nuisance to others.

C. An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of petroleum products is prohibited. The use of chlorides may be permitted with approval from the Engineer.

D. To be approved, sprinkling must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor shall have sufficient competent equipment on the job to accomplish this. Dust control shall be performed as the Work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Owner.

3.05 NOISE CONTROL

A. The Contractor shall make every effort to minimize noises caused by the construction operations. Equipment shall be equipped with silencers or mufflers

designed to operate with the least possible noise in compliance with Federal and State regulations.

3.06 MAINTENANCE OF POLLUTION-CONTROL FACILITIES DURING CONSTRUCTION

A. During the life of this Contract, the Contractor shall maintain all facilities constructed for pollution control as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created.

END OF SECTION

SECTION 01355
SPECIAL PROVISIONS

PART 1 GENERAL

1.01 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

B. Unless specified otherwise in the Contract Documents, all equipment supplied under these Specifications shall be warranted by the Contractor and the equipment manufacturers for 1 year. The warranty period shall begin on the date of Owner acceptance.

C. The equipment shall be warranted to be free from defects in workmanship, design, and materials. If any part of the equipment should fail during the warranty period, it shall be replaced in the machine(s) and the unit(s) restored to service at no expense to the Owner.

D. The manufacturer's warranty period shall run concurrently with the Contractor's warranty or guarantee period. No exception to this provision shall be allowed. The Contractor shall be responsible for obtaining equipment warranties in accordance with Section 01780, Warranties and Bonds, from each of the respective suppliers or manufacturers for all the equipment specified under the Contract Documents.

E. If the manufacturer is unwilling to provide a 1-year warranty beginning at the time of Owner acceptance, the Contractor shall obtain from the manufacturer a 2-year warranty starting at the time of equipment delivery to the job site. This 2-year warranty shall not relieve the Contractor of the 1-year warranty starting at the time of Owner acceptance of the equipment.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 INSTALLATION OF EQUIPMENT

A. The Contractor shall take special care to ensure proper alignment of all equipment with particular reference to the pumps and electric drives. The units shall be carefully aligned on their foundations by qualified millwrights after the units' sole plates have been shimmed to true alignment at the anchor bolts. The anchor bolts shall be set in place and the nuts tightened against the shims. After the Engineer has approved the foundation alignments, the bedplates or wing feet of the equipment shall be securely bolted in place. The Contractor shall further check the alignment of the equipment after it is secured to the foundations and, after all alignments are conformed, shall finally grout the sole plates in place. The Contractor shall be responsible for the exact alignment of equipment with associated piping and under no circumstances will "pipe springing" be allowed.

B. The Contractor shall furnish all wedges, shims, filling pieces, keys, packing, grout, or other materials necessary to properly align, level, and secure apparatus in place. All parts intended to be plumb or level must be proven to be exactly so. The Contractor shall perform all grinding necessary to bring parts to proper bearing after erection.

1.05 SLEEVES AND OPENINGS

A. The Contractor shall provide all openings, channels, chases, etc., in new construction and furnish and install anchor bolts and other items to be embedded in concrete, as required to complete the Work under this Contract. The Contractor shall perform all cutting, coring, and rough and finish patching required in existing construction for the work of all trades.

B. Subcontractors shall furnish all sleeves, inserts, hangers, anchor bolts, etc., required for the execution of their work. Before the work of the Contractor begins, the subcontractors shall be responsible for furnishing the Contractor with the above items and with templates, drawings, or written information covering chases, openings, etc., which they require and to follow up the work of the Contractor as it progresses, making sure that their drawings and written instructions are carried out. If the subcontractors fail to do this, they shall be responsible for the cost of any corrective measures that may be required to provide necessary openings, etc. If the Contractor fails to carry out the directions given him, covering details and locations of openings, etc., he shall be responsible for any cutting and refinishing required to make the necessary corrections. In no case shall beams, lintels, or other structural members be cut without the approval of the Engineer.

1.06 GREASE, OIL, AND FUEL

A. The Contractor shall furnish all grease, oil, and fuel required for testing equipment with the respective equipment. The Owner shall be furnished with a year's supply of required lubricants including grease and oil of the type recommended by the manufacturer with each item of equipment supplied under the Contract Documents.

1.07 TOOLS

A. The Contractor shall furnish any special tools (including grease guns or other lubricating devices) which may be necessary for the adjustment, operation, and maintenance of any equipment with the respective equipment.

B. Tools shall be furnished in heavy steel toolboxes complete with lock and duplicate keys.

1.08 PIPE MARKING

A. Pipe marking is included in Division 9 under Painting and Coating, but it shall be the Contractor's responsibility, as required by the Engineer, to help identify pipe contents, direction of flow, and all else required for proper marking of pipe.

1.09 VALVE IDENTIFICATION

A. The Contractor shall prepare a valve schedule for all valves required for the Work showing a number, the location, type, function, and normal operating position for each valve. The schedule shall be submitted to the Engineer for approval not less than 120 days before start-up. The Contractor shall coordinate valve identification with Section 15110, Manual, Check, and Process Valves.

B. The Contractor shall furnish tags for all valves required for the Work. Valve tags shall be 2-inch diameter, 19-gauge, brass or plastic, with brass hooks suitable for attaching the tag to the valve operator. Tags shall be stamped or etched with the valve number and the information on the valve schedule coded in a system provided by the Owner. The Contractor shall submit two samples of the type of tag proposed and the manufacturer's standard color chart and letter styles to the Engineer for approval.

C. The Contractor shall install valve tags on all valves required for the Work.

1.10 NOISE LIMITATIONS

A. All equipment to be furnished under this Contract, unless specified otherwise in the Technical Specifications, shall be designed to ensure that the sound pressure level does not exceed 85 decibels over a frequency range of 37.8 to 9,600 cycles per second at a distance of 3 feet from any portion of the equipment, under any load condition, when tested using standard equipment and methods. Noise levels shall include the noise from the motor. Mufflers or external baffles shall not be acceptable for reducing noise. Data on noise levels shall be included with the shop drawing submittal.

1.11 SPARE PARTS

A. Where spare parts are specified in the Specification Sections, the Contractor shall furnish all spare parts recommended by the manufacturer or system supplier for 1 year of service. In addition, the Contractor shall furnish all spare parts itemized in each Section.

B. The Contractor shall collect and store all spare parts in an area to be designated by the Engineer and shall furnish the Engineer with an inventory listing all spare parts, the equipment they are associated with, the name and address of the supplier, and the delivered cost of each item. Copies of actual invoices for each item shall be furnished with the inventory to substantiate the delivery cost.

C. Spare parts shall be packed in cartons properly labeled with indelible markings with complete descriptive information, including manufacturer, part number, part name, and equipment for which the part is to be used and shall be properly treated for 1 year of storage.

1.12 HURRICANE PREPAREDNESS PLAN

A. Within 30 calendar days of the date of Notice to Proceed, the Contractor shall submit a Hurricane Preparedness Plan to the Engineer and the Owner for approval. The Plan shall describe in detail the necessary measures that the Contractor will perform, at no additional costs to the Owner, in case of a hurricane warning. The Contractor shall revise the Plan as required by the Engineer and Owner.

1.13 WEATHER PROTECTION

A. In the event of inclement weather, the Contractor shall protect the Work and materials from damage or injury from the weather. If, in the opinion of the Engineer, any portion of the Work or materials has been damaged by reason of failure on the part of the Contractor to protect the Work, such Work and materials

shall be removed and replaced with new materials and Work to the satisfaction of the Engineer.

1.14 PROVISIONS FOR CONTROL OF EROSION

A. The Contractor shall take sufficient precautions during construction to minimize the run-off of polluting substances such as silt, clay, fuels, oils, bitumens, calcium chloride, or other polluting materials harmful to humans, fish, or other life, into the supplies and surface waters of the State. Control measures must be adequate to ensure that turbidity in the receiving water will not be increased more than 10 nephelometric turbidity units (NTU), or as otherwise required by the State or other controlling body, in water used for public water supply or fish unless limits have been established for the particular water. In surface water used for other purposes, the turbidity must not exceed 25 NTU unless otherwise permitted. Special precautions shall be taken in the use of construction equipment to prevent operations that promote erosion.

1.15 PROVISIONS FOR THE CONTROL OF DUST AND LITTER

A. The Contractor shall take sufficient precautions during construction to minimize the amount of dust created. Wetting down the Site may be required or as directed by the Engineer to prevent dust as a result of vehicular traffic. Control of blowing litter caused by any regrading by the Contractor shall be the responsibility of the Contractor.

1.16 ON-SITE STORAGE

A. The Contractor should note that there may be special storage requirements and possible charges for noncompliance of on-site storage requirements for materials and equipment as specified in Section 01600, Materials and Equipment.

1.17 ELECTRICAL POWER AND TESTING EQUIPMENT

A. The Contractor shall furnish electric power and all equipment and tools required for testing equipment. The cost of this electric power, equipment, and tools shall be included in the prices quoted in the Bid Form.

1.18 PROTECTION AGAINST ELECTROLYSIS

A. Where dissimilar metals are used in conjunction with each other, the Contractor shall provide suitable insulation between adjoining surfaces to eliminate direct contact and any resulting electrolysis. The insulating material shall be bituminous impregnated felt, heavy bituminous coatings, nonmetallic separators or washers, or other approved materials.

1.19 DAMAGE DUE TO HIGH WATER

A. The Contractor will be responsible for all damage done to his work by heavy rains or floods and he shall take all reasonable precautions to provide against damages by building such temporary dikes, channels, or shoring to carry off stormwater as the nature of the work may require.

1.20 EMERGENCY PHONE NUMBERS AND ACCIDENT REPORTS

A. Emergency phone numbers (fire, medical, police) shall be posted at the Contractor's phone and the phone's location be made known to all.

B. Accidents shall be reported immediately to the Engineer by messenger or phone.

C. The Contractor shall document all accidents and shall submit to the Engineer a fully detailed written report about the accident after each accident.

1.21 ITEMS SPECIFIED ON DRAWINGS

A. Items of material, equipment, machinery, and the like may be specified on the Drawings and not in the Specifications. The Contractor shall provide such items in accordance with the Specification on the Drawings.

1.22 DISINFECTION

A. The Contractor shall clean, disinfect, and bacteriologically test and clear, in accordance with Chapters 62-550, 62-555, and 62-560 of the Florida Administrative Code (FAC), all water supply facilities affected by this project which shall come into contact with raw water, water being treated, or treated water before placing the facility in operation. This shall apply to new facilities installed as well as to existing facilities that are to be modified.

B. The Contractor shall employ a disinfection method approved by the Engineer and Owner and shall fully satisfy the Owner that adequate disinfection has been achieved before placing a facility on-line.

C. The cost of all disinfection work shall be included in the prices quoted in the Proposal. The Contractor shall pay for all bacteriological clearance tests.

1.23 SALVAGE

A. Any existing equipment or material, including but not limited to valves, pipes, fittings, couplings, etc., which is removed or replaced as a result of construction

under this project may be designated as salvage by the Engineer or Owner and, if so, shall be excavated, if necessary, and shall be cleaned and stored on or adjacent to the Site in a protected place specified by the Engineer or loaded onto trucks provided by the Owner. Any equipment or material not worthy of salvaging, as directed by the Owner, shall be disposed of by the Contractor at a suitable location at the Contractor's expense.

1.24 WORKMANSHIP, MATERIAL, AND EQUIPMENT

A. When a particular product or products are specified or called for, it is intended and shall be understood that the proposal tendered by the Contractor include those products in his bid. Should the Contractor desire to substitute a product or products equal to those specified, the Contractor shall furnish information as described in the Standard General Conditions. The alternate product or products submitted by the Contractor shall meet the requirements of the Specifications and shall, in all respects, be equal to the product or products specified by name in the Specifications.

B. All apparatus, mechanisms, equipment, machinery, and manufactured articles for incorporation into the Work shall be the new and unused standard products of recognized reputable manufacturers.

1.25 SERVICES OF MANUFACTURERS' FIELD SERVICE TECHNICIAN

A. Bid prices of equipment furnished under the Contract Documents shall include the cost of a competent field service technician of the manufacturers of all equipment to supervise the installation, adjustment, and testing of the equipment and to instruct the Owner's operating personnel on operation and maintenance. The approved manufacturer's operation and maintenance data as specified in Section 01830, Operations and Maintenance Manuals, shall be delivered to the Engineer before instructing the Owner's personnel. This supervision may be divided into two or more periods as required by the installation program or as directed by the Engineer.

B. After the equipment has been installed and the equipment is presumably ready for operation, but before it is operated by others, the manufacturers' field service technician shall inspect, operate, test, and adjust the equipment. The inspection shall include at least the following points where applicable:

1. Soundness (without cracked or otherwise damaged parts).
2. Completeness in all details, as specified and required.
3. Correctness of setting, alignment, and relative arrangement of various parts.
4. Adequacy and correctness of packing, sealing, and lubricants.

5. Calibration and adjustment of all related instrumentation and controls.
6. Energize equipment.
7. Deficiency correction.
8. Demonstration of compliance with application performance specification.

C. The operation, testing, and adjustment shall be as required to prove that the equipment has been left in proper condition for satisfactory operation under the conditions specified.

D. Upon completion of this operation, testing, and adjustment, the manufacturers' field service technician shall submit to the Engineer, in triplicate, a complete, signed report of the results of the inspection, operation, adjustments, and tests. The report shall include detailed descriptions of the points inspected, tests and adjustments made, quantitative results obtained if such are specified, and suggestions for precautions to be taken to ensure proper maintenance.

E. Each equipment manufacturer shall provide instruction to the Owner's operating personnel. Training shall not be performed until the requirements of Paragraphs B, C, and D above have been fully satisfied and any specified performance testing completed. Training shall be provided on an 8-hour-per-day basis. Partial days (less than 8 full working hours) shall not be credited toward the specified durations. Training shall not be concurrent with on-going testing, debugging, or installation activities but shall be a separate activity devoted exclusively to the instruction of the Owner's personnel in the operation and maintenance of the manufacturers' equipment. Training shall be performed by qualified representatives of each equipment manufacturer specifically skilled in providing instruction to operation personnel. Training shall provide an overview of operations and maintenance requirements and shall include but not be limited to the following:

1. Description of unit and component parts.
2. Operating capabilities and performance criteria.
3. Operating procedures.
4. Maintenance procedures.
5. Servicing and lubrication schedules.
6. Troubleshooting.
7. Electrical instrumentation and control requirements and interface as a minimum. The operating and maintenance data to be provided in accordance with Section 01830, Operations and Maintenance Manuals, shall be used as a basis for training.

F. A certificate from the manufacturer stating that the installation of the equipment is satisfactory; that the unit has been satisfactorily tested and is ready for operation; and that the operating personnel have been suitably instructed in the operation,

lubrication, and care of the unit shall be submitted before start-up and acceptance by the Owner. The certificate shall indicate date and time the instruction was given and names of the operating personnel in attendance.

G. See the detailed Specifications for additional requirements for furnishing the services of the manufacturers' field service technician.

1.26 OPERATING AND MAINTENANCE DATA

A. Operating and maintenance data covering all equipment furnished shall be delivered directly to the Engineer, for approval, within 60 days before the facility's start-up. No payment shall be made for equipment installed or stored on site until the Engineer has approved the adequacy and completeness of the operating and maintenance data. Data shall be prepared and submitted in full conformance with Section 01830, Operations and Maintenance Manuals. Final approved copies of operating and maintenance data shall have been delivered to the Engineer on the Owner's behalf 2 weeks before scheduling the instruction period with the Owner.

1.27 RESPONSIBILITY OF CONTRACTOR

A. The Contractor shall be responsible for the entire Work determined by the Drawings, Specifications, and Contract from the date of the starting of the Work until it is accepted as evidence of approval of the Completion Certificate by the Owner. The Contractor shall be responsible for removals, renewals, and replacements due to action of the elements and all other causes except as otherwise provided in the Specifications. The Contractor shall keep the Contract under his own control, and it shall be his responsibility to see that the Work is properly supervised and carried on faithfully and efficiently. The Contractor shall supervise the work personally or shall have a competent English-speaking superintendent or representative, who shall be on the site of the project at all working hours and who shall be empowered with full authority by the Contractor to direct the performance of the Work and make arrangement for all necessary materials, equipment, and labor without delay.

B. Renewals or repairs required because of defective materials or workmanship or due to the action of the elements or other natural causes, including fire and flood, before the acceptance as determined by the Completion Certificate, shall be done in accordance with the Contract and Specifications at the expense of the Contractor.

1.28 CONSTRUCTION CONDITIONS AND SUBSURFACE INVESTIGATION

A. The Contractor shall strictly adhere to the specific requirements of the governmental unit(s) or agency(ies) having jurisdiction over the Work. Wherever there is a difference in the requirements of a jurisdictional body and these Specifications, the more stringent shall apply.

B. The Contractor shall be responsible for having determined to his satisfaction, before submitting his bid, the nature and location of the Work, the conformation of the ground, the character and quality of the substrata, the types and quantity of materials to be encountered, the nature of the groundwater conditions, the character of equipment and facilities needed before and during the execution of the Work, the general and local conditions, and all other matters which can in any way affect the Work under this Contract. The prices established for the work to be done will reflect all costs pertaining to the Work. Any claims for extras based on substrata, groundwater table, and other such conditions will not be allowed.

1.29 SUSPENSION OF WORK DUE TO WEATHER

A. During inclement weather, all work which might be damaged or rendered inferior by such weather conditions shall be suspended. The orders and decisions of the Engineer as to suspensions shall be final and binding. The ability to issue such an order shall not be interpreted as a requirement to do so. During suspension of the work from any cause, the Work shall be suitably covered and protected so as to preserve it from injury by the weather or otherwise, and if the Engineer shall so direct, the rubbish and surplus materials shall be removed.

1.30 PERMITS

A. Upon notice of award, the Contractor shall immediately apply for all applicable permits not previously obtained by the Owner to do the Work from the appropriate governmental agency or agencies. No work shall begin until all applicable permits have been obtained and copies delivered to the Engineer. The Contractor shall bear all costs for obtaining all permits.

1.31 PUMPING

A. The Contractor with his own equipment shall do all pumping necessary to prevent flotation of any part of the structures during construction operations.

B. For the duration of the Contract and with his own equipment, the Contractor shall pump out water and wastewater which may seep or leak into the excavations or structures. Galleries and other operating areas shall be kept dry at all times. The

Engineer will determine the extent of pumping required in the tanks, channels, and other non-operating areas.

1.32 OWNER OCCUPANCY AND OPERATION OF COMPLETED FACILITIES

A. It is assumed that portions of the Work will be completed before the entire work is completed. Upon completion of construction in each individual facility, including testing, if the Owner, at its sole discretion, desires to accept the individual facility, the Contractor will be issued a dated certificate of completion and acceptance for each individual facility. The Owner will assume ownership and begin operation of the individual facility on that date and the 1-year guaranty period shall begin on that date. The Owner has the option of not accepting any individual completed facility, but accepting the entire work as a whole when it is completed and tested.

1.33 CLAIMS FOR PROPERTY DAMAGE

A. Upon notification by the Owner or Engineer, the Contractor shall investigate each claim for property damage and shall file, within 10 days of such notification, a statement with the Owner or Engineer setting forth all facts and details relative to the claim.

1.34 DAILY REPORTS

A. The Contractor shall submit daily reports of construction activities, including non-workdays. The report shall include the following:

1. Manpower, number of workers by craft.
2. Equipment on the project.
3. Major deliveries.
4. Activities work with reference to the CPM schedule activity numbers.
5. New problems.
6. Other pertinent information.

B. A similar report shall be submitted for/by each subcontractor.

C. The reports shall be submitted to the Engineer’s Field Office within 2 days of the respective report date. Each report shall be signed by the Contractor’s Superintendent or Project Manager.

1.35 CONNECTIONS TO EXISTING SYSTEMS

A. The Contractor shall perform all work necessary to locate, excavate, and prepare for connections to the terminus of the existing systems all as shown on the

Drawings or where directed by the Engineer. The cost of this work and for the actual connection of the existing mains shall be included in the bid for the Project and shall not result in any additional cost to the Owner.

1.36 COORDINATION OF WORK

A. Because of the nature of this Project, the Contractor should expect other construction to occur in the vicinity of this Project during the Contract. In such instances the Contractor will be required to cooperate fully to eliminate or minimize the creation of conflicts. Adjustments from time to time may be required in the Contractor's work location and/or schedule provided a reasonable notice is given by the Owner or Engineer.

B. The Contractor shall afford other contractors and the Owner reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work and shall properly connect and coordinate the Work with such other work. The Contractor shall coordinate his Work with the Owner and other contractors to store his apparatus, materials, supplies, and equipment in such orderly fashion at the site of the Work so that it will not unduly interfere with the progress of the Work or the work of any other contractors.

C. If the execution or result of any part of the Work depends on any work of the Owner or of any separate contractor, the Contractor shall, before proceeding with the Work, inspect and promptly report to the Owner in writing any apparent discrepancies or defects in such work of the Owner or of any separate contractor that render it unsuitable for the proper execution or result of any part of the Work.

D. Failure of the Contractor to inspect and report any deficiencies shall constitute an acceptance of the Owner's or separate contractor's work as fit and proper to receive the Work, except as to defects which may develop in the Owner's or separate contractor's work after completion of the Work and which the Contractor could not have discovered by his inspection before the Work was completed.

E. If the Contractor damages the work or property of the Owner or of any separate contractor on the Project or other work on the Site, or delays or interferes with the Owner's work on ongoing operations or facilities or adjacent facilities or the separate contractor's work, the Contractor shall be liable for damage caused, and, in the case of another contractor, the Contractor shall attempt to settle the claim with the other contractor before the other contractor institutes litigation or other proceedings against the Contractor.

F. If a separate contractor sues the Owner on account of any damage, delay, or interference caused or alleged to have been caused by the Contractor, the Owner shall notify the Contractor, who shall defend the Owner in such proceedings at the

Contractor's expense. If any judgment or award is entered against the Owner, the Contractor shall satisfy the same and shall reimburse the Owner for all damages, expenses, attorneys' fees, and other costs which the Owner incurs as a result of the judgment or award.

G. If a separate contractor causes damage to the Work or to the property of the Contractor or causes delay or interference with the Contractor's performance of the Work, the Contractor shall present directly to the separate contractor any claims it may have as a result of such damage, delay, or interference (with an information copy to the Owner) and shall attempt to settle its claim against the separate contractor before instituting litigation or other proceedings against the separate contractor.

H. In no event shall the Contractor seek to recover from the Owner or the Engineer, and the Contractor hereby represents to the Owner and the Engineer that he will not seek to recover from them, or either of them, any costs, expenses, (including, but not limited to, attorneys' fees) or losses of profit incurred by the Contractor as a result of any damage to the Work or property of the Contractor or any delay or interference caused or allegedly caused by any separate contractor.

I. The Engineer shall determine and adjust any difference or conflict which may arise between the Contractor and other contractors who may be performing work on behalf of the Owner or between the Contractor and workmen of the Owner in regard to their work. If the work of the Contractor is delayed because of any acts of omissions of any other contractor of the Owner, the Contractor shall on that account have no claim against the Owner other than for an extension of time.

1.37 FINAL GUARANTEE

A. The Contractor shall guarantee all work for 1 year from the date of Substantial Completion of the Work by the Owner.

B. If, within the guarantee period, repairs or changes are required in connection with guaranteed work, which, in the opinion of the Engineer, are rendered necessary as the result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, the Contractor shall do the following promptly upon receipt of notice from the Owner and without expense to the Owner:

1. Place in satisfactory condition in every way all such guaranteed work and correct all defects in the guaranteed work.
2. Make good all damage to the building or site, or equipment or piping, or their contents, which, in the opinion of the Engineer, is the result of the

use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract.

3. Make good any work or material or the equipment and contents of the building, structure, or site disturbed in fulfilling any such guarantee.

C. If the Contractor, after notice, fails to proceed to comply with the terms of this guarantee within 10 days, the Owner may have the defects corrected and the Contractor and his surety shall be liable for all expenses incurred provided. However, that in case of an emergency where, in the opinion of the Owner, delay would cause loss or damage, repairs may be started without notice being given to the Contractor and the Contractor shall pay the cost of such repairs.

D. All special guarantees or warranties applicable to specific parts of the Work as may be stipulated in the Contract Specifications or other papers forming a part of this Contract shall be subject to the terms of this Paragraph during the first year of life of each such guarantee. The Contractor shall assemble all special guarantees and manufacturers' warranties, along with a summary list of the special guarantees and warranties, and deliver these to the Engineer before the Work is accepted.

1.38 AUTOMATICALLY CONTROLLED EQUIPMENT

A. Whenever batching or mixing plant equipment is required to be operated automatically under the Contract and a breakdown or malfunction of the automatic controls occurs, the equipment may be operated manually or by other methods for 48 hours after the breakdown or malfunction, provided this method of operation will produce results otherwise meeting the Specifications.

1.39 EQUIPMENT DATA FORMS

A. The Contractor shall obtain, prepare, and submit a complete, detailed listing of equipment and motor data for all electrical items furnished under this Contract. This listing shall be submitted with the preliminary draft of Operations and Maintenance Data Manuals on Equipment Data sheets and the Equipment Manufacturer’s Certificate of Installation, Testing, and Instruction and the Manufacturer’s Certificate of Compliance forms.

1.40 RIGHTS IN AND USE OF MATERIALS FOUND ON THE WORK

A. With the approval of the Engineer, the Contractor may use on the project such stone, gravel, sand, or other material determined suitable by the Engineer as may be found in the excavation and will be paid both for the excavation of such materials at the corresponding Contract unit price and for the pay item for which the excavated material is used. The Contractor shall replace at his own expense,

with other acceptable material, all of that portion of the excavation materials so removed and used which were needed for use in the embankments, backfills, approaches, or otherwise. No charge for the materials used will be made against the Contractor.

1.41 OWNER-FURNISHED MATERIAL

A. The Contractor shall furnish all materials required to complete the Work. No materials will be furnished by the Owner.

1.42 MAINTENANCE AND LUBRICATION SCHEDULES

A. The Contractor's attention is directed to Section 01830, Operations and Maintenance Manuals, for requirements relative to the submission of operating and maintenance data for the mechanical equipment. For all mechanical and electrical equipment furnished, the Contractor shall provide a list including the equipment name, address, and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.

1.43 INSTALLATION LISTS

A. All manufacturers or equipment suppliers who propose to furnish equipment or products under the Contract Documents shall submit an installation list to the Engineer along with the required Shop Drawings.

B. The installation list shall include all installation where identical equipment has been installed and has been in operation for at least 1 year.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01400
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. General

1. This Section defines minimum requirements for the Quality Assurance (QA) Program to be provided by the Contractor. The deliverable documents are defined, along with the method of execution of the QA Program.
2. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with the Contract Document requirements.
3. Specified tests, inspections, and related actions do not limit the Contractor's Quality Control (QC) procedures that facilitate compliance with the Contract Documents.

B. Definitions

1. Quality Assurance services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with Contract requirements.
2. Quality Control services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction comply with requirements.

C. Payment

1. Separate payment will not be made for providing and maintaining an effective Quality Assurance and Quality Control Program, and all costs associated with such a program shall be included in the applicable unit prices, lump-sum prices, or allowances contained in the Contract Price Breakdown.

1.02 WORK SEQUENCE

A. Where reference is made to a particular standard, the revision in effect at the time of Bid opening shall apply except where a specific date is established.

B. For products or workmanship specified by association, trades, or other consensus standards, the Contractor shall comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable code.

C. If specified reference standards conflict with Contract Documents, the Contractor shall request clarification from the Engineer before proceeding.

1.03 QUALITY ASSURANCE

A. The Contractor shall install all materials and equipment in a neat and first-class workman-like manner.

B. The Contractor shall replace all existing paving, stabilized earth, curbs, driveways, sidewalks, fences, signs, and other improvements with the same type of material that was removed during construction or as directed by the Engineer without increase in the Contract Price or Contract Time.

C. The Engineer reserves the right to direct the removal and replacement of any items which, in the Engineer's opinion, do not present an orderly and reasonably neat or workman-like appearance, provided such an orderly installation can be made using customary trade methods. The removal and replacement shall be done when directed in writing by the Engineer at the Contractor's own expense and without additional expense to the Owner.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 TOLERANCES

A. Monitor tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. If manufacturers' tolerances conflict with Contract Documents, request clarification from the Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.07 FIELD SAMPLES

A. The Contractor shall furnish field samples at the site as required by individual Specifications Sections for review.

B. Acceptable samples represent a quality level for the Work.

C. Where field sample is specified in individual Sections to be removed, the Contractor shall clear the area after the field sample had been accepted by the Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. The Contractor is responsible for quality control and shall establish and maintain an effective QC system in compliance with the Contract Documents. The QC system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the Contract requirements. The system shall cover all Work and shall be keyed to the proposed design and construction sequence. The project QC Officer will be held responsible for the quality of work on the job and is subject to removal by the Engineer for non-compliance with quality requirements specified in the Contract. The project QC Officer in this context shall mean the individual with the responsibility for the overall management of the project quality.

3.02 QUALITY CONTROL PLAN

A. General: Not later than 30 calendar days after receipt of Notice to Proceed, the Contractor shall furnish for review by the Engineer the QC Plan proposed to implement the requirements of the Contract. The Plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. The Engineer will consider an interim plan for the first 30 calendar days of operation.

B. Content of the QC Plan: The QC Plan shall include, at a minimum, the following to cover all construction operations, both on-site and off-site, including work by subcontractors, fabricators, suppliers, and purchasing agents:

1. A description of the quality control organization, including a chart showing lines of authority for all aspects of the Work specified. The staff shall include a Quality Control Officer who shall report to the Project Manager or executive.
2. The name, qualifications (in résumé format), duties, responsibilities, and authorities of each person assigned a QC function.
3. A copy of the letter to the Quality Control Officer signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the Quality Control Officer, including authority to stop work which is not in compliance with the Contract.
4. Procedures for scheduling, reviewing, certifying, and managing submittals, including those of subcontractors, off-site fabricators, suppliers, and purchasing agents.
5. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will verify that identified deficiencies have been corrected.
6. Reporting procedures, including proposed reporting formats.

C. Acceptance of Plan

1. Acceptance of the Contractor's plan is required before the start of Work. Acceptance is conditional and will be predicated on satisfactory performance during the Work. The Engineer reserves the right to require the Contractor to make changes in its QC Plan and operations, including removing personnel as necessary to obtain the quality specified.

D. Notification of Changes

1. After acceptance of the QC Plan, the Contractor shall notify the Engineer in writing of any proposed change. Proposed changes are subject to acceptance by the Engineer.

3.03 SUBMITTALS

A. Submittals shall be made as specified in Section 01330, Submittals and Acceptance. The QC organization shall be responsible for certifying that all submittals are in compliance with the Contract requirements.

3.04 TESTS

A. Testing Services

1. All tests to determine compliance with the Contract Documents shall be performed by an independent commercial testing firm acceptable to the Owner. The testing firm's laboratory shall be staffed with experienced technicians, properly equipped, and fully qualified to perform the tests in accordance with the specified standards.
2. Testing services provided by the Owner are for the sole benefit of the Owner; however, test results shall be available to the Contractor. Testing necessary to satisfy the Contractor's internal Quality Control Procedures shall be the sole responsibility of the Contractor.
3. When necessary, the Contractor shall interrupt its Work for Owner sampling and testing. The Contractor shall have no Claim for increase in Contract Price or Contract Time due to such interruption. The Contractor shall cooperate in these testing activities as needed.
4. Testing, including sampling, will be performed by the testing firm's laboratory personnel in the general manner indicated in the Specifications.

B. Transmittal of Test Reports

1. Written reports of tests and engineering data furnished by the Contractor for the Engineer's review shall be submitted as specified for Shop Drawings.

C. Manufacturer's Field Services (As Applicable)

1. The manufacturer's field services will be specified in the respective Equipment Sections.
2. An experienced, competent, and authorized representative of the manufacturer of each item of equipment for which field services are indicated shall visit the Site of the Work and inspect, check, adjust if necessary, and approve the equipment installation. In each case the manufacturer's representative shall be present when the equipment is placed in operation. The manufacturer's representative shall revisit the Site as often as necessary until any and all trouble is corrected and the equipment installation and operation are satisfactory in the opinion of the Engineer.
3. Each manufacturer's representative shall furnish to the Owner, through the Engineer, a written report certifying that the equipment has been properly installed and lubricated, is in accurate alignment, is free from any undue stress imposed by connecting piping or anchor bolts, has been operated under full load conditions, and has operated satisfactorily.

3.05 COMPLETION INSPECTION

A. Final Completion Punch List: Near the completion of all Work the QC Officer shall inspect the Work and develop a "punch list" of items which do not conform to the approved Drawings and Specifications. Such a list of deficiencies shall be included in the QC documentation and shall include the estimated date by which the deficiencies will be corrected. The QC Officer or staff shall make a second inspection to ascertain that all deficiencies have been corrected. Once this is accomplished, the Contractor shall notify the Engineer that the Facility is ready for the Engineer's final inspection.

B. Final Inspection and Acceptance: The Contractor's Quality Control Officer and the Engineer will be in attendance at this inspection. Additional Engineer personnel may also be in attendance. The final acceptance inspection will be formally scheduled by the Engineer when all punch list deficiencies have been corrected. Notice will be given to the Engineer at least 14 days before the final inspection and must include the Contractor's assurance that all punch list items will be complete and acceptable by the date scheduled for the final inspection. Failure of the Contractor to have all Contract Work acceptably complete for this inspection will be cause for noncertification of final payment by the Engineer.

3.06 NOTIFICATION OF NONCOMPLIANCE

A. The Engineer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Engineer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

3.07 REPAIR AND PROTECTION

A. On completion of testing, inspection, sampling, and similar services, the Contractor shall repair damaged construction and restore substrates and finishes.

B. The Contractor shall protect all construction exposed by or for Quality Control service activities.

C. The repair and protection are the Contractor's responsibilities, regardless of the assignment of responsibility for Quality Control services.

END OF SECTION

SECTION 01450
TESTING AND TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Owner will pay for the costs of all passing laboratory tests required to determine soil density, concrete compressive strength, and bacteriological clearance of water main. The cost of all testing shall be paid for from the Bid Item allowance as stated in the Bid Form. Costs will be determined from direct invoices from the testing laboratory to the Contractor. Failed tests will be back-charged to the Contractor at the time of final payment. All required soil, concrete, and bacteriological water testing shall be coordinated with and scheduled by the Contractor.

1. The Contractor shall cooperate with the laboratory to facilitate the execution of required services.
2. The Owner shall approve the selection of the testing laboratory.
3. Employment of a testing laboratory shall in no way relieve the Contractor of the obligation to perform work in accordance with the requirements of the Contract Documents.

1.02 RELATED WORK

A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders, or approvals of public authorities.

B. Respective Sections: Certification of products.

C. Each Section listed: Laboratory tests required and standards for testing.

D. Testing Laboratory inspection, sampling, and testing are required for but are not limited to the following:

1. Section 02230, Site Preparation.
2. Section 02305, Earthwork for Utilities.
3. Section 02700, Earthwork, Paving, and Markings.
4. Section 03301, Concrete and Reinforcing Steel.
5. Section 15055, Piping Systems—General.
6. Section 15141, Disinfection of Piping and Water Storage Facilities.

1.03 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. Submit to the Engineer for review a list and schedule of all tests to be conducted.

C. Describe test procedures along with duration of tests.

D. After each inspection and test, the Laboratory shall promptly submit two copies of the laboratory report to the Engineer, one copy to the Contractor, and one copy to the Owner.

E. Include the following:

1. Date issued.
2. Project title and number.
3. Name of field testing technician or inspector.
4. Date and time of sampling or inspection.
5. Identification of product and Specifications Section.
6. Location in the Project.
7. Type of inspection or test.
8. Date of test.
9. Results of test.
10. Conformance with Contract Documents.

F. When requested by the Engineer, provide interpretation of test results.

1.04 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM E329—Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.
2. ASTM D3740—Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

1.05 QUALITY ASSURANCE

A. The Laboratory is not authorized to do any of the following:

1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of the work.
3. Perform any duties of the Engineer of Record or the Engineer.

B. The Contractor shall be responsible for the following:

1. Cooperating with laboratory personnel, providing access to work and to manufacturer's operations.

2. Securing and delivering to the laboratory adequate quantities of representative samples of materials proposed to be used and which require testing.

3. Providing to the laboratory the preliminary design mix proposed to be used for concrete and other materials mixes which require control by the testing laboratory.

4. Furnishing incidental labor and facilities:

a. To provide access to work to be tested.
b. To obtain and handle samples at the project site or at the source of the product to be tested.
c. To facilitate inspections and tests.
d. To store and cure test samples.

5. Notifying the Engineer and laboratory sufficiently in advance of operations to allow for the laboratory to assign personnel and schedule tests.

6. Employing and paying for the services of the same or a separate, equally qualified independent testing laboratory to perform additional inspections, sampling, and testing required for the Equipment Supplier or Contractor's (as applicable) convenience.

C. Materials and equipment used in the performance of Work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. Standard requirements for quality and workmanship are indicated in the Contract Documents. The Engineer may require the equipment supplier or Contractor (as applicable) to provide statements or certificates from the manufacturers and fabricators that the materials and equipment provided by them are manufactured

or fabricated in full accordance with the standard specifications for quality and workmanship indicated in the Contract Documents. All costs of this testing and providing statements and certificates shall be a subsidiary obligation of the Contractor, and no extra charge to the Owner shall be allowed on account of such testing and certification.

D. If the test and any subsequent retest results indicate that the materials or equipment fail to meet the requirements of the Contract Documents, the equipment supplier or Contractor (as applicable) shall pay for the laboratory costs directly to the testing firm and these will not be reimbursable to the equipment supplier or Contractor (as applicable).

1.06 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.07 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.08 QUALIFICATIONS

A. Comply with requirements of ASTM E329 and ASTM D3740.

B. Laboratory: Licensed to operate in Florida.

C. Laboratory Staff: Maintain a full-time Professional Engineer registered in Florida on staff to review the services performed under this project.

D. Testing Equipment: Calibrated at reasonable intervals with devices of accuracy traceable to either National Bureau of Standards (NBS) or accepted values of natural physical constants.

E. Provide qualified personnel at the site. Cooperate with the Engineer and Contractor in performing services.

F. Perform specified inspection, sampling, and testing of products in accordance with specified standards.

G. Ascertain compliance of materials and mixes with requirements of Contract Documents.

H. Promptly notify the Engineer and Contractor of observed irregularities or non-conformance of Work or Products.

I. Perform additional inspections and tests required by Engineer.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01500
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.02 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.03 RESPONSIBILITY

A. This Section specifies the minimum requirements for temporary facilities, utilities, and controls required to provide an adequate and safe work site at every stage during construction of the Project. The Contractor is solely responsible for the requirements set forth in this Section.

1.04 ONSITE TEMPORARY

A. Except as otherwise indicated, the Contractor may, at his option, furnish stand-alone utility plants to provide needed services in lieu of connected services from available public utilities, provided such stand-alone plant facilities comply with all governing regulations. Before availability of temporary utility services, the Contractor will provide trucked-in/trucked-out containerized or unitized services for start-up of construction operations at the site.

1.05 COSTS

A. Except as otherwise indicated, the costs of providing and using temporary utility services are included in the Contract Sum.

1.06 TEMPORARY FACILITIES

A. The types of utility services required for temporary use at the project site include the following (other specific services may be required for specific construction methods of operations):

1. Electrical Power Service.
2. Water Service (potable for certain uses).
3. Sanitary.
4. Storm Sewer or Open Drainage/Run-off Control.
5. Gas (fuel) Service.
6. Telephone Service.

1.07 TEMPORARY ELECTRICITY

A. The Contractor shall make the necessary applications and arrangements and pay all fees and charges for electrical energy for power and light necessary for proper completion of the Work and during its entire progress up to time of final acceptance by the Owner. The Contractor shall provide and pay for all temporary switches, connections, and meters.

1.08 TEMPORARY WATER

A. The Contractor shall make all necessary application and arrangements and pay all fees and charges for water necessary for the proper completion of the Project up to the time of final acceptance. The Contractor shall provide and pay for any temporary piping and connections.

1.09 TEMPORARY SANITARY FACILITIES

A. The Contractor shall provide adequate sanitary facilities for the use of those employed on the Work. Such facilities shall be made available when the first employees arrive on the site of the Work, shall be properly secluded from public observation, and shall be constructed and maintained during the progress of the Work in suitable numbers and at such points and in such manner as may be required or approved.

1.10 CLEANLINESS OF FACILITIES

A. The Contractor shall maintain the sanitary facilities in a satisfactory and sanitary condition at all times and shall enforce their use. He shall rigorously prohibit the committing of nuisances on the site of the Work, on the lands of the Owner, or on adjacent property.

1.11 TERMINATION AND REMOVAL

A. At the time the need for a temporary utility service has ended or has been replaced by use of permanent services, or not later than the time of final completion, the Contractor shall promptly remove the installation unless requested by the Engineer to retain it for a longer period. Any work which may have been delayed or affected by the installation and use of the temporary utility, including repairs to construction and grades and restoration and cleaning of exposed surfaces, shall be completed at this time. The Contractor shall replace any work damaged beyond acceptable restoration.

1.12 NOISE CONTROL

A. The Contractor shall provide adequate protection against objectionable noise levels caused by the operation of construction equipment.

1.13 DUST CONTROL

A. The Contractor shall provide for adequate protection against raising objectionable dust clouds caused by moving construction equipment, high winds, or any other cause.

1.14 WATER CONTROL

A. The Contractor shall provide for satisfactory disposal of surplus water and shall submit a plan to the Engineer for review before initiating and implementing the plan. Prior approval shall be obtained from the proper authorities for the use of public or private lands or facilities for such disposal.

1.15 POLLUTION CONTROL

A. The Contractor shall provide for adequate protection against polluting any public or private lands, lakes, ponds, rivers, streams, creeks, and other such areas by the disposal of surplus material in the form of solids, liquids, gases, or from any other cause.

1.16 ADVERSE IMPACT

A. The Contractor shall evaluate and assess the impact of any adverse effects on the natural environment which may result from construction operations and shall operate to minimize pollution of air, ground, or surface waters vegetation, and afford the neighboring community the maximum protection during and up to completion of the construction project.

1.17 STREAMS, LAKES, AND OTHER BODIES OF WATER

A. The Contractor shall take sufficient precautions to prevent pollution of streams, lakes, and reservoirs with fuels, oils, bitumens, calcium chloride, or other harmful materials. He shall conduct and schedule his operations so as to avoid or otherwise prevent pollution of siltation of streams, lakes, and reservoirs and to avoid interference with the movements of migratory fish.

1.18 CHEMICALS

A. All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant, or of other classification, must show approval of either US EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions.

1.19 EROSION CONTROL

A. The Contractor shall not expose by construction operations a larger area of erosive land at any one time than the minimum necessary for efficient construction operations, and the duration of exposure of the uncompleted construction to the elements shall be as short as practicable. Erosion-control features shall be constructed concurrently with other work and at the earliest practicable time.

1.20 STORAGE FACILITIES

A. All products, materials, and equipment shall be stored in accordance with the manufacturer's instructions, with seals and labels intact and legible. Products subject to damage by the elements shall be stored in weathertight enclosures. Temperature and humidity shall be maintained within the ranges required by the manufacturer's instructions. Fabricated products shall be stored above the ground on blocking or skids. Products which are subject to deterioration shall be covered with impervious coatings with adequate ventilation to avoid condensation. Loose granular materials shall be stored in a well-drained area on solid surfaces to prevent mixing with foreign matter. Any products which will come in contact with water shall be stored off the ground to prevent contamination.

1.21 INSPECTION

A. Storage shall be arranged in such a manner to provide easy access for inspection. Periodic inspections shall be made of all stored products to ensure that they are maintained under specified conditions and free from damage or deterioration.

1.22 TEMPORARY PROTECTION

A. After installation, the Contractor shall provide substantial coverings as necessary to installed products to protect them from damage from traffic and subsequent construction operations. Coverings shall be removed when no longer needed.

1.23 ADJACENT TO WORK

A. The Contractor shall protect from damage all property along the line of the Work or in the vicinity of or in any way affected by the Work, the removal or destruction of which is not called for by the Drawings. Wherever such property is damaged due to the activities of the Contractor, it shall be immediately restored to its original condition by the Contractor at no cost to the Owner.

1.24 REMEDY BY OWNER

A. In case of failure on the part of the Contractor to restore such property or make good such damage or injury, the Owner may, after 48 hours' notice to the Contractor, proceed to repair, rebuild, or otherwise restore such property as may be deemed necessary and the cost of such repairs, rebuilding, or restoration will be deducted from any monies due or which may become due to the Contractor under this Contract.

1.25 PROTECTION FROM DAMAGE

A. The Contractor shall be responsible for protecting property in the areas in the vicinity of the Project and for protecting his equipment, supplies, materials, and work against any damage resulting from the elements, such as flooding, rainstorm, wind damage, or other such damage, and shall be responsible for damage resulting from the same. The Contractor shall provide adequate drainage facilities, tie-downs, or other protection throughout the Contract period for the protection of his, the Owner's, and other properties from such damage.

1.26 TRAFFIC REGULATION

A. Signs, marking barricades, and procedures shall conform to the requirements of the Florida Department of Transportation Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System, Index 600 Series, Traffic Control Through Work Zones.

1.27 SIGNAGE

A. The Contractor shall provide and maintain adequate barricades around open excavations.

1.28 REMOVAL OF SIGNAGE

A. On completion of the Work, the Contractor shall remove all debris, excess materials, barricades, and temporary work, leaving walkways and roads clear of obstructions.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01600
MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01 SCOPE OF WORK

This Section includes the minimum requirements for the furnished materials and equipment for this project. The more stringent requirements in the Technical Specification sections shall take precedence over these requirements for any conflicts.

A. Materials and equipment furnished by the Contractor shall be new and shall not have been in service at any other installation unless otherwise approved. They shall conform to applicable specifications approved in writing by the Engineer.

B. Manufactured and fabricated products shall be designed, fabricated, and assembled in accordance with the best engineering and shop practices. Like parts of duplicate units shall be manufactured to standard sizes and gauges so as to be interchangeable.

C. Quantities of items that are identical shall be by the same manufacturer, regardless of the Design Package breakdown.

D. Equipment sizes, capacities, and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing.

E. Materials and equipment shall not be used for any purpose other than that for which they are designed or specified.

F. Where materials or equipment are specifically shown or specified to be reused in the Work, special care shall be used in removing, handling, storing, and reinstalling to ensure their proper function in the completed Work.

G. Material and Equipment Incorporated Into the Work

1. Shall conform to applicable specifications and standards.

2. Shall comply with size, make, type, and quality specified or as specifically approved in writing by the Engineer.

3. Manufactured and fabricated products:

a. Rotating machinery shall be designed and fabricated to provide satisfactory operation without excessive wear and without excessive maintenance during its operating life. Rotating parts shall be statically and dynamically balanced and shall operate without excessive vibration.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 ACCEPTANCE OF MATERIAL AND EQUIPMENT

A. Only new materials and equipment shall be incorporated in the Work. All materials and equipment furnished by the Contractor shall be subject to the inspection and acceptance of the Engineer. No material shall be delivered to the site that does not meet the Contract Specifications.

B. The Contractor shall submit data and samples sufficiently early to permit consideration and acceptance before materials are necessary for incorporating in the work. Any delay of acceptance resulting from the Contractor's failure to submit samples or data promptly shall not be used as a basis of claim against the Owner.

C. The materials and equipment used in the Work shall correspond to the approved samples or other data.

D. If requested, the Contractor shall be required to submit to the Engineer ample evidence that each and every part of the materials, machinery, and equipment to be furnished is of a reliable make and of a type that has been in successful operation within the continental United States. No equipment will be considered unless the manufacturer has designed and manufactured equipment of a comparable type and size for at least 3 years. The Engineer or Owner will not allow any experimental or untried type of material or machinery to be installed.

E. The equipment specified shall be carefully designed and installed to ensure that it adequately performs all required functions within the specified degree of precision. Each unit shall operate with each of the other parts of the equipment to provide a completely integrated system that shall operate to the satisfaction of the Engineer and Owner.

F. All equipment, machinery, parts, and assemblies of equipment, machinery, or parts entering into the Work shall be tested as specified. Unless waived in writing by the Engineer, all field and operating tests shall be made in the presence of the Engineer or the Engineer's authorized representative. When such a waiver is issued, the Contractor or manufacturer shall furnish sworn statements in duplicate of the tests conducted and the results of the tests to the Engineer.

G. The Contractor shall submit copies of welding procedures for all welding. Welders and welding operators shall be selected in accordance with the qualification requirements of the AWS Code. Welders and welding operators for stainless steel shall pass qualification tests using stainless steel filler metal and procedures developed for stainless steel. Procedures, welder, and operator qualifications shall be certified by an independent testing laboratory retained and paid by the Contractor.

H. The Contractor shall not start fabrication of the Work until the Contractor receives written acceptance of the proof of welding procedures from the Engineer for each type of weld.

I. The Contractor shall submit copies of mill certificate for each type of rolled steel and as required in the Specifications. The Contractor shall not start fabrication of the work until the Contractor receives written acceptance of all mill certificates from the Engineer.

1.05 MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION

A. The equipment installation details shall suit the existing and furnished equipment and are subject to acceptance by the Engineer.

B. Any changes or revisions made necessary by the type and dimensions of the equipment furnished shall be made at the expense of the Contractor who shall furnish detailed drawings showing such changes or revision for the acceptance of the Engineer.

C. The installation of all work shall comply with the manufacturer's printed instructions. The Contractor shall obtain and distribute copies of such instructions to parties involved in the installation, including six copies to the Engineer for

distribution. One complete set of instructions shall be maintained at the job site during installation and until the Project is complete.

D. All products and equipment shall be handled, installed, connected, cleaned, conditioned, and adjusted in accordance with the manufacturer's instructions and specified requirements. Should job conditions or specified requirements conflict with the manufacturer's instructions, such conflicts shall be called to the Engineer's attention for resolution and revised instructions.

E. The Contractor shall perform work according to the manufacturer's instructions and not omit any preparatory step or installation procedure unless the instructions are specifically modified or the step or procedure exempted by the Contract Documents.

1.06 INSTALLATION OF EQUIPMENT

A. The cost of the Work shall include the cost of competent manufacturers' representatives of all equipment to supervise the installation, adjustment, and testing of the equipment and to instruct the Owner's operating personnel on operation and maintenance.

B. A certificate from the manufacturer stating that the installation of the equipment is satisfactory, that the unit has been satisfactorily tested, is ready for operation, and that the operating personnel have been suitably instructed in the operation, lubrication, and care of the unit shall be submitted before Substantial Completion.

C. The Contractor shall furnish the service of competent manufacturers' representatives for Contractor- or Owner-furnished equipment when evident malfunction or over-heating makes such services necessary or as determined by the Engineer. All such equipment shall be installed by skilled mechanics and in accordance with the instructions of the manufacturer.

D. Special care shall be taken to ensure proper alignment of all equipment with particular reference to mechanical equipment such as pumps and electric drives. These units shall be carefully aligned on their foundations by qualified millwrights after their sole or base plates have been shimmed to true alignment at the anchor bolts. The anchor bolts shall be set in place and the nuts tightened against the shims. After the manufacturer has approved the foundation alignments, the bedplates or wing feet of the equipment shall be securely bolted in place. The alignment of equipment shall be further checked after securing to the foundations. After all alignments are confirmed, the sole or base plates shall be finally grouted in place. The Contractor shall be responsible for the exact alignment of equipment with associated piping, and under no circumstances, will

"pipe springing" be allowed. Special installation requirements in the Technical Specifications shall take precedence over the requirements of this Section.

E. The Contractor shall furnish all wedges, shims, filling pieces, keys, packing, grout, or other materials necessary to properly align, level, and secure an apparatus in place. All parts intended to be plumb or level must be proven exactly so. Any grinding necessary to bring parts to proper alignment after erection shall be done at the expense of the Contractor.

F. The Contractor shall furnish the necessary materials and construct suitable concrete foundations or pads for all equipment installed by the Contractor, even though such foundations or pads may not be indicated on the Drawings. The tops of foundations shall be at such elevations as will permit grouting.

G. In setting pumps, motors, and other items of equipment customarily grouted, the Contractor shall make an allowance of at least 1 inch (2.54 cm) for grout under the equipment bases. Shims used to level and adjust the bases shall be steel. Shims may be left embedded in the grout, in which case they shall be installed neatly and so as to be as inconspicuous as possible in the completed work. Unless otherwise permitted, all grout shall be a suitable non-shrinking grout.

1. Grout shall be mixed and placed in accordance with the recommendations of the manufacturer. Where practicable, the grout shall be placed through the grout holes in the base and worked outward and under the edges of the base and across the rough top of the concrete foundation to a peripheral form so constructed as to provide a suitable chamber around the top edge of the finished foundation.
2. Where such procedure is impracticable, the method of placing grout shall be as permitted. After the grout has hardened sufficiently, all forms, hoppers, and excess grout shall be removed, and all exposed grout surfaces shall be patched in an approved manner and, if necessary, as required by the Engineer, given burlap-rubbed finish, and painted with at least two coats of an acceptable paint.

1.07 SPECIAL TOOLS

A. Manufacturers of equipment and machinery shall furnish two sets of any special tools (including grease guns or other lubricating devices) required for normal adjustment, operations and maintenance, and disassembly, together with instructions for their use. The Contractor shall preserve and deliver to the Owner these tools and instructions in good order before completing the Contract. Tools shall be high-grade, smooth, forged, alloy tool steel. Grease guns shall be lever-type.

B. Special tools are considered to be those tools which because of their limited use are not normally available, but which are necessary for the particular equipment.

C. Special tools shall be delivered at the same time as the equipment to which they pertain. The Contractor shall properly store and safeguard such special tools until completion of the work, at which time they shall be delivered to the Owner.

1.08 LUBRICATION SYSTEM

A. The minimum design criteria for lubricating moving parts of the equipment shall include 1 week of continuous operation during which no lubricants shall be added to the system.

B. The system shall be designed to receive lubricants whether in operation or shut down and shall not leak or waste lubricants under either condition. The manufacturer's recommendations of grade and quality and a supply of the lubricants so recommended in quantities sufficient to conduct start-up and testing operations shall be furnished with the equipment.

1.09 TESTS AND TEST REPORTS

A. When used in the Contract Documents, "Factory/Fabricating Shop Performance, Evaluation, Certification, and/or Acceptance Tests and Test Reports" shall be considered to mean the corresponding manufacturer’s, fabricator's, and/or other builder's official test and tests reports. Included in these test reports shall be appropriate substantiating documentation/data ascertaining the correct and complete manufacture, fabrication, and "shop performance" (to the greatest extent normally practicable) of the particular material, equipment, system, and/or facilities proposed for eventual delivery. These are subdivided into three significant tests and test report types: 1) Certification Tests and Test Reports, 2) Factory Tests and Test Reports, and 3) Shop Performance/Evaluation Tests and Test Reports. Minimal requirements are described below.

B. Certification Tests and Test Reports

1. Standard specifications, code references, etc. for minimum quality and workmanship levels are indicated in the Contract Documents and Construction Documents. Statements, certificates, and other substantiating reporting data, called "Certification Test Reports" in this Section, of tests conducted on previously manufactured materials or equipment identical to that proposed for use shall be compiled by the Contractor.
2. At a minimum all Certification Test Reports shall contain an official analysis of sufficient material composition or show evidence of meeting or exceeding the specified material standard(s) referenced, e.g., ASTM,

ASME, or other designations. All reports shall also indicate from whom the material was/will be purchased.

3. The Contractor shall pay all costs of certification tests and test reports.

C. Factory Tests and Test Reports

1. Additional tests and reports performed on material or equipment by the manufacturer or fabricator to ascertain quality or workmanship are referred to here as "Factory Tests and Test Reports."
2. Before the delivery of any Factory Test Report, the Contractor shall first submit for review and approval a detailed description of the proposed testing, including reporting procedure and criteria. Such descriptions shall also be delivered to the Engineer for review as part of the first submission of the technical submittal.
3. Materials and equipment used in the performance of the Work under this Contract are subject to inspection and testing at the point of manufacture or fabrication. If Work to be accomplished away from the construction site is to be inspected on behalf of the Owner during its fabrication or manufacture, the Contractor shall give prior notice to the Engineer of the place and time where such fabrication or manufacture is to be done. Such notice shall be in writing and delivered to the Engineer not less than 30 days before the Work is to be done so that the necessary arrangements for the particular factory inspection tests can be made.
4. Upon completion of the factory inspection tests and immediately following manufacture or fabrication, the Contractor shall compile a complete Factory Test Report following the approved format above. All such reports shall be delivered to the Engineer for review as part of the technical submittal corresponding to such tested material or equipment.

D. Shop Performance/Evaluation Tests and Test Reports

1. Material and equipment used in the performance of the Work of this Contract are also subject to evaluation and testing after the complete full-scale assembly into major equipment and/or systems. Shop Performance/ Evaluation Tests, i.e., tests of simulated startup, steady-state, variable loading, and other normal operating conditions, for such assembled equipment/systems shall be accomplished in strict accordance with the standard testing practices specified or otherwise accepted by the Engineer.
2. Before the delivery of any Shop Performance/Evaluation Test Report, the Contractor shall submit for review a detailed description of the proposed performance/evaluation tests, including anticipated reporting procedures, data reduction, and criteria used. Where appropriate, such descriptions shall also be delivered to the Engineer for review as part of a first or subsequent submission of the technical submittal.

3. Should such performance/evaluation tests be accomplished away from the construction site, the Contractor shall give prior notice to the Engineer of the places and times where such tests will be accomplished. Such prior notice shall be in writing and delivered not less than 30 days before such events so that necessary arrangements for the particular tests can be made.
4. The requirements above pertaining to Factory Tests and Test Reports shall be incorporated for shop Performance/Evaluation Tests and Test Reports. Unless factory tests are coincident with shop performance tests and vice versa for the same material or equipment, a minimum of 15 days shall be scheduled between such multiple equipment tests where extended travel is required.

E. Cost of Performance Shop Tests

1. The Contractor shall conduct shop performance full-scale tests at its expense on all equipment as specified. Each piece of equipment shall be tested completely assembled and the shop tests performed by the equipment manufacturer until successful tests are achieved.
2. If the performance tests are conducted outside the continental United States, the Contractor shall pay all transportation expenses incurred by the Owner’s representatives in witnessing the tests at no additional cost to the Owner.

1.10 FIELD TESTING

A. Field-testing shall be conducted when called for in the Technical Specification Sections and on all completed systems in general. The Contractor shall provide services of a factory-authorized service representative to perform, approve, and certify the field testing specified in this Section. Field testing shall generally consist of performing the pre-startup and startup tests and the final mechanical performance test as specified in the Contract Documents. The Contract Documents may require the Contractor to perform factory testing on equipment items before the Engineer approves their use for this project. The Contractor shall refer to the Contract Documents regarding equipment shop testing requirements.

B. After completing the installation, the Contractor shall test the system in the presence of the Engineer and under actual operating conditions. Tests shall be performed according to the manufacturer's recommendations.

C. The Contractor shall include with its bid the services of the equipment manufacturer's field service technician for a period necessary to complete the Work to the satisfaction of the Engineer and the Owner.

D. This service shall be for the purposes of checkout, initial start-up, certification, and instruction of facilities personnel.

E. A written report covering the technician's findings and installation approval shall be submitted to the Engineer covering all inspections and outlining in detail any deficiencies noted.

1.11 ACCEPTANCE OF INSTALLATION

A. The Engineer may accept an equipment system installation as ready for Substantial Completion when:

1. The Engineer has accepted all factory tests and all other component testing.
2. The Engineer has accepted all performance shop tests.
3. All components of the system are installed and tested, including without limitation hydrostatic tests, leak tests, continuity tests, insulation resistance tests, phase rotation tests, bump tests, stroke testing, calibration, adjustment for proper operation, and all other component tests as appropriate.
4. Field start-up activities have been completed and approved by the Engineer.
5. The appropriate certificates have been submitted.
6. All equipment has met the performance requirements.
7. The Engineer has accepted integrated system tests and adjustments performed by the Contractor to demonstrate that the system as a whole functions reliably and meets the performance requirements, in manual and automatic modes, without failure, fault, or defect of any component or of the system as a whole.
8. The Engineer has accepted integrated facilities tests performed by the Contractor to demonstrate that the entire Construction functions together reliably as an integrated facility and meets the performance requirements, in manual and automatic modes, without failure, fault, or defect of any component.
9. The Engineer has accepted facilities performance tests which demonstrate that the design criteria and performance criteria are met.
10. The Engineer has accepted the O&M Manuals.
11. All required Owner personnel have been trained.
12. All other Contract requirements for Substantial Completion have been satisfied.

1.12 GREASE, OIL, AND FUEL

A. All grease, oil, and fuel required for start-up and testing of equipment shall be furnished with the respective equipment.

B. The Contractor shall be responsible for changing the oil in all drives and intermediate drives of each mechanical equipment from after initial break-in of the equipment, which shall be no greater than 30 days.

1.13 ELECTRICAL EQUIPMENT ENCLOSURES

A. All items of electrical equipment that are furnished with process, heating, ventilating, or other equipment shall conform to the requirements as applicable. Enclosures for electrical equipment, such as switches and starters, shall conform to the requirements as applicable.

1.14 EQUIPMENT DRIVE GUARDS

A. Screens, guards, or cages shall be provided for all exposed rotating or moving parts in accordance with accepted practices of applicable governmental agencies. Unless specified otherwise in the technical sections, guards shall be constructed of galvanized sheet steel or galvanized woven wires or expanded metal set in a frame of galvanized steel members. Guards shall be secured in position by steel braces or straps, which will permit easy removal for servicing the equipment.

1.15 PROTECTION AGAINST ELECTROLYSIS

A. Where dissimilar metals are used in conjunction with each other, suitable insulation shall be provided between adjoining surfaces so as to eliminate direct contact and any resultant electrolysis. The insulation shall be bituminous-impregnated felt, heavy-bituminous coatings, nonmetallic separators or washers, or other acceptable materials.

1.16 CONCRETE INSERTS

A. Concrete inserts for hangers shall be designed to support safely, in the concrete that is used, the maximum load that can be imposed by the hangers used in the inserts. Inserts for hangers shall be of a type which will permit adjustment of the hangers both horizontally (in one plane) and vertically and locking of the hanger head or nut. All inserts shall be galvanized.

1.17 SLEEVES

A. Unless otherwise indicated on the Drawings or specified, openings for the passage of pipes through floors and walls shall be formed of sleeves of standard-weight, galvanized-steel pipe. Each sleeve shall be of ample diameter to pass the pipe and its insulation, if any, and to permit such expansion as may occur. Sleeves shall be of sufficient length to be flush at the walls and the bottom of the slabs and to project 2 inches above the finished floor surface. Threaded nipples shall not be used as sleeves.

B. Sleeves in exterior walls below ground or in walls to have liquids on one or both sides shall have a 2-inch annular fin of 1/4-inch plate welded with a continuous weld completely around the sleeve at about mid-length. Sleeves shall be galvanized after the fins are attached.

C. All sleeves shall be set accurately before the concrete is placed or shall be built-in accurately as the masonry is being built.

1.18 SERVICES OF MANUFACTURER'S REPRESENTATIVE

A. The Contractor shall arrange for a qualified service representative from each company manufacturing or supplying certain equipment as listed in this Section (or in the respective Technical Specification sections) to perform the duties described in this Section.

B. After the listed equipment has been installed and the equipment is presumably ready for operation but before it is operated by others, the representative shall inspect, operate, test, and adjust the equipment. The inspection shall include but not be limited to the following points as applicable:

1. Soundness (without cracked, abraded, or otherwise damaged parts).
2. Completeness in all details, as specified.
3. Correctness of setting, alignment, and relative arrangement of various parts.
4. Adequacy and correctness of packing, sealing, and lubricants.

C. The operation, testing, and adjustment shall be as required to prove that the equipment is left in proper condition for satisfactory operation under the conditions specified.

D. On completion of his or her work, the manufacturer's or supplier's representative shall submit in triplicate to the Engineer a complete, signed report of the result of the inspection, operation, adjustments, and tests. The report shall include detailed descriptions of the points inspected, tests and adjustment made, quantitative

results obtained if such are specified, and suggestions for precautions to be taken to ensure proper maintenance. The report also shall include a certificate that the equipment conforms to the requirements of the Contract and is ready for permanent operation and that nothing in the installation will render the manufacturer's warranty null and void.

E. After the Engineer has reviewed the reports from the manufacturer's representatives, the Contractor shall make arrangements to have the manufacturer's representatives present when the field acceptance tests are made.

F. The Contractor, at a minimum, shall arrange for the service of qualified service representatives from the companies manufacturing or supplying the following equipment and as required in the Technical Specifications:

1. Pumping Equipment.
2. Instrumentation and Control Systems.
3. Programmable Controllers.
4. Hoisting Equipment.
5. Electric Motors.
6. Motor Control Centers.
7. Flow Meters.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01650
DELIVERY, STORAGE, AND HANDLING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section specifies the general requirements for the delivery, handling, storage, and protection of all items required in the construction of the Work. Specific requirements, if any, are specified with the related item.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in this Section for storing and protecting the items.

B. The Contractor shall do the following:

1. Materials and equipment shall be loaded and unloaded by methods affording adequate protection against damage. Every precaution shall be taken to prevent injury to the material or equipment during transportation and handling. Suitable power equipment shall be used and the material or equipment shall be under control at all times. Under no condition shall the material or equipment be dropped, bumped, or dragged. When a crane is used, a suitable hook or lift sling shall be used. The crane shall be so placed that all lifting is done in a vertical plane. Materials or equipment skid loaded, palletized, or handled on skidways shall not be skidded or rolled against material or equipment already unloaded.

2. Material and equipment shall be delivered to the job site by means that will adequately support it and not subject it to undue stresses. Material and equipment damaged or injured in the process of transportation unloading or handling shall be rejected and immediately removed from the site.

3. The Contractor shall coordinate the delivery of all materials, including those furnished by the Owner. The Contractor shall be responsible for the proper transport, handling, and storing of all materials, and materials shall be protected to ensure their expected performance. Delivery schedules

shall be coordinated by the Contractor, in advance, so that the Work will be done in a timely manner.

4. The Contractor shall coordinate deliveries of products with construction schedules to avoid conflict with work and conditions at the site. The Contractor shall also do the following:

    a. Deliver products in undamaged condition, in the manufacturer's original containers or packaging, with identifying labels intact and legible.
    b. Immediately on delivery, inspect shipments to ensure compliance with requirements of the Contract Documents and approved submittals and to ensure that the products are properly protected and undamaged.

5. The Contractor shall provide equipment and personnel to handle products by methods to prevent soiling or damage to products or packaging.

6. All materials and equipment shall be stored on-site in complete compliance with the manufacturer’s recommendations.

7. Store products subject to damage by the elements in weather-tight enclosures.

8. Maintain temperature and humidity within the ranges required by the manufacturer's instructions.

9. Store fabricated products above the ground, on blocking or skids to prevent soiling or staining. Cover products that are subject to deterioration with impervious sheet coverings, and provide adequate ventilation to avoid condensation.

10. All materials and equipment to be incorporated in the Work shall be handled and stored by the Contractor before, during, and after shipment in a manner that will prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft, or damage of any kind to the material or equipment.

11. All materials which, in the opinion of the Engineer, have become so damaged as to be unfit for the use intended or specified shall be promptly removed from the site of the Work, and the Contractor shall receive no compensation for the damaged material or its removal.

12. The Contractor shall arrange storage in a manner to provide easy access for inspection and make periodic inspections of stored products to ensure that products are maintained under specified conditions, free from damage or deterioration.

13. The Contractor shall provide substantial coverings as necessary to protect installed products from traffic damage and subsequent construction operations and shall remove these coverings when they are no longer needed.

14. Should the Contractor fail to take proper action on storage and handling of equipment supplied under this Contract, within 7 days after written notice to do so has been given, the Owner retains the right to correct all deficiencies noted in the previously transmitted written notice and deduct the cost associated with these corrections from the Contractor's Contract. These costs may include expenditures for labor, equipment use, administrative, clerical, engineering, and any other costs associated with making the necessary corrections.

15. Schedule delivery to reduce long-term onsite storage before installation and/or operation. Under no circumstances shall equipment be delivered to the site more than 1 month before installation without written authorization from the Engineer.

16. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged, or sensitive to deterioration.

17. Deliver products to the site in the manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting, and installing.

18. Unload and place all items delivered to the site in a manner which will not hamper normal construction operation nor that of subcontractors and other contractors and will not interfere with the flow of necessary traffic.

19. Provide necessary equipment and personnel to unload all items delivered to the site.

20. The Contractor shall store and protect products in accordance with the manufacturer's instructions, with seals and labels intact and legible. Follow storage instructions, review them with the Engineer, and keep a written record of this. Arrange storage to permit access for inspection.

21. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

22. Store cement and lime under a roof and off the ground and keep it completely dry at all times. All structural, miscellaneous, and reinforcing steel shall be stored off the ground or otherwise to prevent accumulations of dirt or grease and in a position to prevent accumulations of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping, or cracking. Handle and store brick, block, and similar masonry products in a manner to keep breaking, cracking, and spilling to a minimum.

23. Store all mechanical and electrical equipment and instruments subject to corrosive damage by the atmosphere if stored outdoors (even though covered by canvas) in a weathertight building to prevent damage. The building may be a temporary structure on the site or elsewhere, but it must be satisfactory to the Engineer. The building shall be provided with adequate ventilation to prevent condensation. The Contractor shall ensure that temperature and humidity are maintained within the range required by the manufacturer.

    a. All equipment shall be stored fully lubricated with oil, grease, and other lubricants unless otherwise instructed by the manufacturer.
    b. Moving parts shall be rotated a minimum of once weekly to ensure proper lubrication and to avoid metal-to-metal "welding." Upon installation of the equipment, the Contractor shall start the equipment, at least at half load, once weekly for an adequate period to ensure that the equipment does not deteriorate from lack of use.
    c. Lubricants shall be changed when installation is complete and as frequently as required thereafter during the period between installation and acceptance. The Contractor shall put new lubricants into the equipment at the time of acceptance.
    d. Before accepting equipment that has been stored for some time, the Contractor shall have the manufacturer inspect the equipment and certify that its condition has not been detrimentally affected by the long storage period. Such certifications by the manufacturer shall be deemed to mean that the equipment is judged by the manufacturer to be in a condition equal to that of equipment that has been shipped, installed, tested, and accepted in a minimum time period. As such, the manufacturer will guarantee the equipment equally in both instances. If such a certification is not

given, the equipment shall be judged to be defective. It shall be removed and replaced at the Contractor's expense.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01720
FIELD ENGINEERING

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall do the following:

A. Provide and pay for the following field engineering services required for the Project:

1. Survey work required in the execution of the Project.
2. Civil, structural, or other professional engineering services specified or required to execute the Contractor’s construction methods.

B. Retain the services of a registered land surveyor licensed in Florida to do the following:

1. Identify existing control points and property line corner stakes as required.
2. Verify all existing structure locations and all proposed structure corner locations, tank locations, and equipment locations within the Project site.
3. Maintain an accurate location of all buried piping 4 inches in diameter and larger.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. The Contractor shall submit to the Engineer the name and address of the registered land surveyor or professional engineer.

C. On request of the Engineer, the Contractor shall submit documentation to verify the accuracy of field engineering work.

D. The Contractor shall submit a certificate signed by a registered land surveyor certifying that elevations and locations of improvements are in conformance or non-conformance with Subcontract Documents.

E. At the end of the Project and before final payment, submit the certified drawings listed below with the Surveyor's title block (signed and sealed by the registered

land surveyor) of the items listed below. These drawings shall be included with and made a part of the project record documents.

1. Certified site survey at 1-inch = 10-foot scale on sheets 24 inches by 36 inches, indicating the building corners, sidewalks, paved areas, and location of all above-ground structures for the project site.
2. Certified drawing showing the location, lines, and grades of all lines 4 inches in diameter and larger buried and exterior to buildings and other buried facilities (e.g., valves, tanks, vaults) installed as a result of the work. This shall be at the same scale as the Engineer's yard piping drawing and submitted on reproducible tracing paper.
3. Certified drawings showing elevations of all flow control points such as weirs, elevations of all existing and new structures, and equipment.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. All work will be performed in accordance with the Minimum Technical Standards set forth by the Board of Professional Surveyors and Mappers.

1.04 QUALITY ASSURANCE

A. Existing basic horizontal and vertical control points for the project are those designated on Drawings.

B. Locate and protect control points before starting site work and preserve all permanent reference points during construction:

1. Make no changes or relocations without prior written notice to the Engineer.
2. Report to the Engineer when any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.
3. Require the surveyor to correctly replace project control points which may be lost or destroyed.
4. Establish replacements based on original survey control.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 QUALIFICATIONS

A. Registered land surveyor of the discipline required for the specific service on the project, currently licensed in Florida.

1.08 SYSTEM DESCRIPTION

A. The Contractor shall establish a minimum of five (5) permanent benchmarks on the site, referenced to data established by survey control points:

1. Record locations, with horizontal and vertical data, on Record Documents.

B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:

1. Site improvements:

a. Stakes for grading, fill, and topsoil placement.
b. Utility slopes and invert elevations.

2. Foundation and floor levels.

3. Controlling lines and levels required for mechanical and electrical trades.

C. From time to time, verify layouts by the same methods.

D. Maintain a complete and accurate log of all control and survey work as the work progresses.

E. As a condition for approval of monthly progress payment requests, update the project record drawings monthly based on the work performed during the month ending at the pay request. The Contractor shall coordinate this monthly with the Owner's representative on the site as part of the pay request.

F. Maintain an accurate record of piping changes, revisions, and modifications.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01740
FINAL CLEANING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall execute cleaning during progress of the Work and at the completion of the Work as required by General Conditions.

1.02 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.03 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.04 ENVIRONMENTAL CONCERNS

A. Cleaning and disposal operations shall comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 PRODUCTS

2.01 CLEANING MATERIALS

The Contractor shall do the following:

A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.

B. Use only those cleaning materials and methods recommended by the manufacturer of the surface material to be cleaned.

C. Use cleaning materials only on surfaces recommended by the cleaning material manufacturer.

PART 3 EXECUTION

3.01 PERIODIC CLEANING

The Contractor shall do the following:

A. Execute periodic cleaning to keep the work, the site, and adjacent properties free from accumulations of waste materials, rubbish, and windblown debris.

B. Provide onsite containers for the collection of waste materials, debris, and rubbish.

C. Remove waste materials, debris, and rubbish from the site periodically and dispose of at legal areas away from the site.

3.02 DUST CONTROL

The Contractor shall do the following:

A. Clean interior spaces before the start of finish painting and continue cleaning on an as-needed basis until painting is finished.

B. Schedule operations so that dust and other contaminants resulting from cleaning process will not fall on wet or newly coated surfaces.

3.03 FINAL CLEANING

The Contractor shall do the following:

A. Employ skilled workers for final cleaning.

B. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from interior and exterior surfaces exposed to view.

C. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.

D. Before final completion or Owner occupancy, inspect interior and exterior surfaces exposed to view and all work areas to verify that the entire Work is clean.

END OF SECTION

SECTION 01770
PROJECT CLOSEOUT

PART 1 GENERAL

1.01 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.02 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.03 SUBSTANTIAL COMPLETION

A. When the Contractor considers that the Work or designated portion of the Work is Substantially Complete, the Contractor shall submit written notice to the Engineer with a list of items to be completed or corrected.

B. If the Engineer's inspection finds that the Work is not substantially complete, the Engineer will promptly notify the Contractor in writing, listing observed deficiencies.

C. The Contractor shall remedy deficiencies and send a second written notice of Substantial Completion.

D. When the Engineer finds the Work is Substantially Complete the Engineer will prepare a Certificate of Substantial Completion.

1.04 FINAL COMPLETION

A. When the Contractor considers that the Work or designated period of the Work is complete, the Contractor shall submit written certification to the Engineer indicating the following:

1. The Contract Documents have been reviewed.
2. The Work has been inspected for compliance with the Contract Documents.

3. The Work has been completed in accordance with the Contract Documents and deficiencies listed with Certificates of Substantial Completion have been corrected.
4. The Work is complete and ready for final inspection.
5. All required shop drawings, catalog cuts, maintenance manuals, instruction manuals, test reports, samples, operational manuals, and all other submittals have been submitted and reviewed by the Engineer.
6. All deliverables have been delivered or placed as accepted by the Engineer.

B. If the Engineer's inspection reveals that the Work is incomplete, the Engineer will promptly notify the Contractor in writing listing observed deficiencies.

C. The Contractor shall remedy deficiencies and send a second certification of Final Completion.

D. When the Engineer finds that the Work is complete, the Engineer will consider closeout submittals.

1.05 REINSPECTION FEES

A. If the status of Completion of Work requires more than one re-inspection by the Engineer due to failure of the Work to comply with the Contractor's claims on initial inspection, the Owner will deduct from the final payment to the Contractor the amount of the Engineer's compensation for additional re-inspection services.

1.06 CLOSEOUT SUBMITTALS

A. Evidence of Compliance with Requirements of Governing Authorities:

1. Certificate of Occupancy.
2. All required Certificates of Inspection.

B. Operation and Maintenance Manuals: Under provisions of Section 01830, Operations and Maintenance Manuals.

C. Record Documents: Under provisions of Section 01785, Record Documents.

D. Evidence of Payment and Release of Liens: In accordance with Conditions of the Contract.

E. Consent of Surety to Final Payment.

1.07 STATEMENT OF ADJUSTMENT OF ACCOUNTS

A. Submit final statement reflecting adjustments to total Contract Price, indicating the following:

1. Original total Contract Price.
2. Previous change orders.
3. Changes under allowances.
4. Changes under unit prices.
5. Deductions for uncorrected Work.
6. Penalties and bonuses.
7. Deductions for liquidated damages.
8. Deductions for re-inspection fees.
9. Other adjustments to total Contract Price.
10. Total Contract Price as adjusted.
11. Previous payments.
12. Sum remaining due.

B. The Engineer will issue a final Change Order reflecting approved adjustments to the total Contract Price not previously made by change orders.

1.08 APPLICATION FOR FINAL PAYMENT

A. Submit application for final payment in accordance with provisions of Conditions of the Contract.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01780
WARRANTIES AND BONDS

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall do the following:

A. Compile specified warranties and bonds.
B. Co-execute submittals when so specified.
C. Review submittals to verify compliance with Contract Documents.
D. Submit submittals to the Engineer for review.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Assemble warranties, bonds, and service and maintenance contracts executed by each of the respective manufacturers, suppliers, and subcontractors.

B. Number of original signed copies required: two each.

C. Table of Contents: Neatly typed, in sequence of the Specifications. Provide completion information for each item as follows:

1. Product or work item.

2. Firm, address, telephone and fax numbers, and name and email of principal.

3. Scope.

4. Date of beginning of warranty, bond, or service and maintenance contract.

5. Duration of warranty, bond, or service and maintenance contract.

6. Provide information for Owner's personnel:

a. Proper procedure in case of failure.
b. Instances that might affect the validity of warranty or bond.

7. Contractor, with address, telephone and fax numbers, and the name and email of responsible principal.

D. Submittal of warranties, bonds, and service and maintenance contracts shall be included in submittals for review and before Final Completion with actual dates included.

E. The Contractor's obligation to correct defective or nonconforming Work shall run for 1 year (or such longer period may otherwise be specified in the Contract Documents) beginning from the date Substantial Completion is achieved.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and this Section.

B. All mechanical and electrical equipment together with devices of whatever nature and all components which are furnished and/or installed by the Contractor shall be guaranteed.

C. The guarantee shall be against the manufacturing and/or design inadequacies, materials, and workmanship not in conformity, improper assembly, hidden damage, failure of devices and/or components, excessive leakage, or other circumstances which would cause the equipment to fail under normal design and/or specific operating conditions for 1 year or such longer period as may be shown and/or specified from and after the date of Substantial Completion.

D. The Contractor shall replace and install each piece of equipment, device, or component which shall fail within the term specified above of the guarantee with reasonable promptness without increase in the Contract Price. If the Contractor fails to provide timely repairs as specified in this Section, the Owner shall issue a claim against the Contractor's Bond. In some instances, if approved by the Owner, the Contractor may be allowed to repair the equipment.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01785
RECORD DOCUMENTS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section details the minimum requirements for the Contractor for maintenance and recording of Record Documents.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. The Contractor shall store documents and samples in the Contractor's field office apart from documents used for construction and shall do the following:

1. Provide files and racks for storage of documents.
2. Provide cabinet or secure storage space for storage of samples.

B. The Contractor shall institute a computerized record control program.

C. The Contractor shall make documents and samples available at all times for inspection by the Engineer.

D. At Contract closeout, the Contractor shall transmit Record Documents and samples with cover letter to the Engineer, listing the following:

1. Date.
2. Project title and number.
3. Contractor's name and addresses.
4. Number and title of each Record Document.
5. Signature of Contractor or its authorized representative.
6. Contract Section and Subsection numbers.
7. Location.

E. Before assembling and submitting records, the Contractor shall review for completeness the records maintained by its subcontractors.

F. Tracings of all Construction Documents and Shop Drawings made by the Contractor, subcontractors, and suppliers of materials or equipment shall be corrected to show the Work as actually completed or installed.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 PROJECT RECORD

A. The Contractor shall label and file Record Documents and samples in accordance with the corresponding Specification Section number. Each document shall be labeled “PROJECT RECORD” in neat, large, printed letters. Record Documents shall be maintained in a clean, dry, and legible condition. Record Documents shall not be used for construction purposes.

3.02 RECORDING

The Contractor shall record construction information as follows:

A. Record and update daily Record information from field notes on a set of opaque drawings and to the satisfaction of the Engineer.

B. Provide felt tip marking pens, maintaining separate colors for each major system, for recording information.

C. Record information concurrently (daily) with construction progress. Work shall not be concealed until required information is recorded.

D. Mark Record Drawings to reflect the following:

1. Measured horizontal and vertical locations of underground utilities and appurtenances referenced to permanent surface improvements.
2. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
3. Field changes of dimension and detail.

4. Changes made by modifications.
5. Details not on original construction drawings.

E. CAD Requirements for Record Drawings: The Contractor shall provide the Engineer with a complete set of Record Drawings in the version of AutoCAD format specified by the Engineer upon completion of the Work. No additional compensation will be allowed for the Contractor to provide the Record Drawings. The Contractor shall use the AutoCAD drawings furnished by the Engineer for this purpose. Record Drawings must be submitted in the AutoCAD format of the contract drawings. No other CAD software or format will be accepted. It is the Contractor's sole responsibility to ensure that the Record Drawings conform to the following CAD requirements:

1. Drawings shall be submitted to the Engineer on CD-ROM. Each CD shall be clearly labeled with the appropriate project number, client name, date, and file names included on each CD. If files are compressed, a description of the compression software must be included along with a copy of the appropriate uncompressing software.
2. All changes to drawings must be done in accordance with the appropriate scale of the drawing revised and shall be delineated by placing a "cloud" around the areas revised and adding a revision triangle indicating the appropriate revision number.
3. Each drawing must have the revision block completed to indicate the revision number, date, and initials of the person revising the drawing. The description of the revision must say "Record Drawing." This procedure must be followed for every drawing even when no changes are made to the drawing.
4. All revisions to drawings must be put on separate layers with the layer names prefixed Record followed by the appropriate existing layer name. The colors and line types of the appropriate existing layers shall be adhered to when creating new layers.
5. The Contractor shall supply one full set of Record Drawings on reproducible black line prints and five full sets of opaque copies.

F. The Contractor shall have the Licensed Land Surveyor certify the Record Drawings as being correct and complete.

END OF SECTION

SECTION 01830
OPERATIONS AND MAINTENANCE MANUALS

PART 1 GENERAL

1.01 SCOPE OF WORK

The Contractor shall do the following:

A. Compile product data and related information appropriate for the Owner's maintenance and operation of products furnished under the Contract.

1. Prepare operating and maintenance data as specified in this Section and as referenced in other pertinent Sections of the Specifications. The data presented in the Operations and Maintenance (O&M) Manuals shall be specifically related to this Contract and application.
2. Incorporate maintenance and operation data furnished by the Owner, if any.

B. Furnish all labor, equipment, materials, and all other items to supply and deliver to the Engineer O&M Manuals for the Work in accordance with the requirements of this Section.

C. Provide O&M Manuals for all equipment, including instrumentation, electrical, and process control system equipment and software for the entire Facility.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Manuals which, in general, shall have two levels: a facilities-wide systems level and an individual-component level.

1. The facilities-wide systems level shall do the following:

a. Describe the facilities-wide systems, including diagrams.
b. Explain start-up, shutdown, normal operations, and malfunctions of the facilities-wide systems.
c. Tabulate a lubrication schedule for the facilities-wide systems.
d. Describe preventive maintenance checking procedures for the facilities-wide systems.
e. Include a cross-reference to all individual component manuals.

2. The individual-component level shall contain the following:

    a. Storage requirements.
    b. Installation instructions.
    c. Alignment instructions and tolerances.
    d. Operating instructions.
    e. Troubleshooting instructions.
    f. Lubrication requirements.
    g. Maintenance instructions.
    h. Parts list.
    i. Recommended spare parts list and how to obtain same.

B. Format:

1. Size: 8 1/2 x 11 inch (21.59 x 27.94 cm).

2. White paper: 20-lb (9.072 kg) minimum.

3. Text: Manufacturer's printed data or neatly word-processed.

4. Drawings:

    a. Provide reinforced, punched binder tab, bind in with text.
    b. Reduce larger drawings and fold to size of text pages but not larger than 11 x 17 inches (27.94 x 43.18 cm).
    c. Place all drawings at the end of each Section and drawing shall be printed on one side only.

5. Provide a blank page for each separate product or each piece of operation equipment.

    a. Provide a word-processed description of the product and major component parts of equipment.
    b. Provide indexed tabs.

6. Cover: Identify each volume with typed or printed title, "OPERATION AND MAINTENANCE INSTRUCTIONS," listing the following:

    a. Title of Project.
    b. Identity of separate structure as applicable.
    c. Identity of general subject matter covered in the manual.

C. Media

1. Original word-processed CD shall be delivered to the Engineer.
2. All word processing must be done using the latest version of Microsoft Word or as directed by the Engineer.
3. All drawings except control system configuration drawings must be submitted on CD using AutoCAD.

D. Binders

1. Filled to not more than 75% capacity.
2. When multiple binders are used, arrange the data into related consistent groupings.

E. The Contractor shall submit the following:

1. Preliminary O&M Manuals—Five copies of the O&M Instruction Manual for each piece of equipment shall be submitted to the Engineer before delivery of the equipment for review by the Engineer. O&M manuals will not include the manufacturer's test results and Record specifications.
2. Final O&M Manuals—Five copies of the Final Equipment and Systems O&M Manuals, bound and indexed and submitted to the Engineer before the Substantial Completion under this Contract.
3. The cost of these Manuals submitted shall be included in the total Contract Price. Copies supplied under Item 1 will not be included under Item 2.

F. Any modifications required after final O&M submission shall be made to the manuals by issuance of addenda in the form of change pages to the manual. The addenda will identify where the new data are to be inserted, what data are to be removed, and new index sheets as necessary and list of shop drawings and submittals.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to herein shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Administrative Code, 62-555.350, "Operation and Maintenance of Public Water Systems."

B. Florida Administrative Code, 62-600.410, "Operation and Maintenance of Domestic Wastewater Facilities."

1.04 QUALITY ASSURANCE

A. Data shall be prepared by personnel:

1. Trained and experienced in maintaining and operating the described products.
2. Familiar with requirements of this Section.
3. Skilled as a technical writer to the extent required to communicate essential data.
4. Skilled as a draftsman competent to prepare required drawings.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 CONTENTS, EACH VOLUME

A. Neatly word-processed table of contents for each volume, arranged in systematic order, to include the following:

1. Contractor, name of responsible principal, address, fax number, and telephone number.

2. A list of each product required to be included, indexed to content of the volume.

3. A list with each product, name, address, fax number, and telephone number of the following:

a. Subcontractor or installer.
b. A list of each product to be included, indexed to content of the volume.
c. Identify area of responsibility of each subcontractor or installer, if more than one.
d. Local source of supply for parts and replacement.
e. Manufacturer.

4. Identify each product by product name and other identifying symbols as set forth in the Contract Documents.

B. Product Data

1. Include only those sheets that are pertinent to the specific product.

2. Annotate each sheet to achieve the following:

a. Clearly identify the specific product or part installed.
b. Clearly identify data applicable information.
c. Delete references to inapplicable information.

C. Drawings

1. Supplement product data with drawings as necessary to illustrate the following clearly:

a. Relations of component parts of equipment and systems.
b. Control and flow diagrams.
c. Owner Tag Numbers.

2. Coordinate drawings with information in Record Documents to ensure correct illustration of completed installation.

3. Do not use Record Documents as maintenance drawings.

D. Written text as required to supplement product data for the particular installation:

1. Organize in consistent format under separate headings for different procedures.
2. Provide a logical sequence of instructions for each procedure.
3. Describe how the complete system is to operate.

E. Copy of pertinent information related to warranty, bond, and service Contract issued.

1. Provide information sheet for Owner's personnel with the following information:

a. Proper procedures in event of failure.
b. Instances that might affect the validity of warranties or bonds.

F. Training manuals used in training courses will become part of this Manual.

1.08 MANUAL FOR MATERIALS AND FINISHES

A. Content, for applied materials and finishes:

1. Manufacturer's data, giving full information on products:

a. Catalog number, size, composition.
b. Color and texture designations.
c. Information required for re-ordering special-manufactured products.

2. Instructions for care and maintenance:

a. Manufacturer's recommendation for types of cleaning agents and methods.
b. Cautions against cleaning agents and methods that are detrimental to product.
c. Recommended schedule for cleaning and maintenance.

B. Content, for moisture-protected and weather-exposed products:

1. Manufacturer's data, giving full information on products:

a. Applicable standards.
b. Chemical composition.
c. Details of installation.

2. Instructions for inspection, maintenance, and repair.

C. Additional requirements for maintenance data as required by other Sections of the Specifications.

1.09 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Content, for each electrical, mechanical, instrumentation, and communication system, as appropriate:

1. A table identifying each piece of equipment, each associated control or instrument, the location of the control or instrument, and the function of the control or instrument.

2. A description of the system and its component parts:

    a. Function, normal operating characteristics, and limiting conditions for the system, the sub-system, and the component parts.
    b. Performance curves, engineering data, and tests.
    c. Complete nomenclature and commercial numbers of replaceable parts.

3. Circuit directories of panel board:

    a. Electrical service.
    b. Controls.
    c. Communications.

4. As-installed color-coded wiring diagrams.

5. Instrument loop diagrams showing the path that a control or instrumentation signal takes from its origin to the action it takes.

    a. An electrical schematic for each item.
    b. A chart listing the controls/instruments in a loop identifying the equipment's abbreviated symbol, a description of the symbol, design criteria, process flow, quantity supplied, and manufacturer's model and serial number.

6. Operating procedures:

    a. Routine and normal operating instructions.
    b. Sequences required.
    c. Special operating instructions.

7. Maintenance procedures:

    a. Routine operations.
    b. Guide to "trouble-shooting."
    c. Disassembly, repair, and re-assembly.
    d. Alignment, adjustment, and checking.

8. The manufacturer's printed operating and maintenance instructions.

9. A list of the original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

10. Other data as required under other Sections of the Specifications.

11. Abnormal and emergency operations:

    a. Potential overloads.
    b. Procedures for equipment breakdown.
    c. Action to be taken in a power outage.
    d. Identity of alarms by equipment location and action to correct.
    e. Equipment safety features, requirements, and potential hazards.

12. Programming manuals for programmable devices including list of standard programming.

B. Content, for each unit of equipment and system, as appropriate:

1. Description of unit and component parts:

    a. Function, normal operating characteristics, and limiting conditions.
    b. Performance curves, engineering data, and tests.
    c. Complete nomenclature and commercial number of replaceable parts.
    d. Model number and name plate data for each piece of equipment.
    e. Assembly drawings.
    f. List of all special tools required to service equipment and/or systems including where the tools are stored.

2. Operating procedures:

    a. Start-up, break-in, routine, and normal operating instructions.
    b. Regulation, control, stopping, shut-down, and emergency instructions.
    c. Summer and winter operating instructions.
    d. Special operating instructions.
    e. Control settings and ranges.

3. Maintenance procedures:

    a. Type and frequency of preventive maintenance activities required for each piece of equipment.
    b. Guide to "trouble-shooting."
    c. Disassembly, repair, and re-assembly.
    d. Alignment, adjusting, and checking.

4. Servicing and lubrication schedule:

    a. List of lubricants required.
    b. Period between lubrications.

5. Manufacturer's printed operating and maintenance instructions. (This is not to be a generalized catalog of the entire product line.)

6. Description of sequence of operation.

7. The original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance:

    a. Predicted life of parts subject to wear.
    b. Items recommended to be stocked as spare parts.

8. As-installed control diagrams.

9. Each Contractor's coordination drawings.

10. List of the original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

11. Other data as required under pertinent Sections of the Specifications.

12. Charts of equipment, instrument, and valve tag numbers with location and function:

    a. Reference drawing which shows equipment, instrument, or valve location.
    b. Manufacturer's model and serial number.
    c. Valve actuator type (manual, hydraulic, electric, or pneumatic).

13. Local services (process water and air, drains, HVAC, natural gas and steam).

C. The Contractor shall prepare and include additional data when the need for such data becomes apparent during instruction of the Owner's personnel.

D. Additional requirements for O&M data required by other Sections of the Specifications.

PART 2 PRODUCTS

2.01 O&M MANUALS

A. Binders: The manuals shall be supplied in binders that are the same as those provided in Paragraph 1.03.D above.

B. Electronic Version: Word-processed portions of the manuals shall also be provided on CDs. The electronic version manuals must be capable of being read, edited, and printed with Microsoft Word or Owner-approved file format at the time of the transmittal of documents. The format will be provided to the Contractor upon request. All drawings shall be generated using personal computer and plotter with the software package program from AutoCAD.

PART 3 EXECUTION (NOT USED)

END OF SECTION

DIVISION 2

SITE CONSTRUCTION

SECTION 02000
REFERENCED FDOT SPECIFICATIONS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to provide for the construction where indicated on the Drawings.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product data for reinforced concrete pipe, along with gaskets, is required to indicate performance in accordance with the specifications.

B. Shop drawings for drainage structures including curb inlets, ditch bottom inlets, manholes, and mitered end sections is required to indicate performance in accordance with the specifications. Include shop drawings for frames, covers, and grates with each drainage structure.

C. Submit maintenance of traffic plan(s) for each phase of construction.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Specification Section shall be the latest revision of any such document in effect at the bid time, unless otherwise noted. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section. The referenced FDOT Standard Specifications that apply to this project include the following sections along with the sections referenced within these sections:

- 102 Maintenance of Traffic

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this contract.

2. Payment for this project is in accordance with the Bid Form.
3. Additional requirements superseding the applicable portions of the above FDOT Standard Specifications are provided in the subsequent sections of these Technical Specifications.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Specification Section 01780, Warranties and Bonds.

PART 2 PRODUCTS

2.01 GENERAL

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section. The referenced FDOT Standard Specifications that apply to this project include the following sections along with the sections referenced within these sections:

- 102 Maintenance of Traffic

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this contract.
2. Payment for this project is in accordance with the Bid Form.
3. Additional requirements superseding the applicable portions of the above FDOT Standard Specifications are provided in the subsequent sections of these Technical Specifications.

PART 3 EXECUTION

3.01 GENERAL

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section. The referenced FDOT

Standard Specifications that apply to this project include the following sections along with the sections referenced within these sections:

- 102 Maintenance of Traffic

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this contract.
2. Payment for this project is in accordance with the Bid Form.
3. Additional requirements superseding the applicable portions of the above FDOT Standard Specifications are provided in the subsequent sections of these Technical Specifications.

END OF SECTION

SECTION 02230
SITE PREPARATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, and equipment required and perform all site preparation, complete as shown on the Drawings and as specified in this Section.

B. The Contractor shall obtain all permits required for site preparation before proceeding with the work, including clearing and tree removal.

C. The areas to be cleared, grubbed, and stripped within public rights-of-way and utility easements shall be minimized to the extent possible for the scope of pipeline work and in consideration of the actual means and methods of construction used. No unnecessary site preparation shall be performed within these areas.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. Submit to the Engineer copies of all permits required before clearing, grubbing, and stripping work.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 CLEARING

A. The Contractor shall cut and remove all timber, trees, stumps, brush, shrubs, roots, grass, weeds, rubbish, and any other objectionable material resting on or protruding through the surface of the ground.

B. The Contractor shall preserve and protect trees and other vegetation designated on the Drawings or directed by the Engineer to remain as specified below.

3.02 GRUBBING

A. The Contractor shall grub and remove all stumps, roots in excess of 1-1/2 inches in diameter, matted roots, brush, timber, logs, concrete rubble, and other debris encountered to a depth of 18 inches below original grade or 18 inches beneath the bottom of foundations, whichever is deeper.

B. The Contractor shall refill all grubbing holes and depressions excavated below the original ground surface with suitable materials and compact to a density conforming to the surrounding ground surface in accordance with Section 02305, Earthwork for Utilities.

3.03 STRIPPING

A. The Contractor shall strip topsoil from all areas to be occupied by buildings, structures, and roadways and all areas to be excavated or filled.

B. Topsoil shall be free from brush, trash, large stones, and other extraneous material. Avoid mixing topsoil with subsoil.

C. The Contractor shall stockpile and protect topsoil until it is used in landscaping, loaming, and seeding operations and dispose of surplus topsoil after all work is completed.

3.04 DISPOSAL

A. Dispose of material and debris from site preparation operations by hauling such materials and debris to an approved off-site disposal area. No rubbish or debris of any kind shall be buried on the site.

B. Burning of cleared and grubbed materials or other fires for any reason will not be permitted.

3.05 PROTECTION

A. Trees and other vegetation designated on the Drawings or directed by the Engineer to remain shall be protected from damage by all construction operations by erecting suitable barriers, guards and enclosures, or by other approved means. The Contractor shall conduct clearing operations in a manner to prevent falling trees from damaging trees and vegetation designated to remain and to the work being constructed. The Contractor shall provide for the safety of employees and others.

B. The Contractor shall maintain protection until all work in the vicinity of the work being protected has been completed.

C. The Contractor shall not operate heavy equipment or stockpile materials within the branch spread of existing trees.

D. The Contractor shall immediately repair any damage to existing tree crowns, trunks, or root systems. Roots exposed and/or damaged during the work shall immediately be cut off cleanly inside the exposed or damaged area. Treat cut surfaces with an acceptable tree wound paint and topsoil spread over the exposed root area.

E. When work is completed the Contractor shall remove all dead and downed trees. Live trees shall be trimmed of all dead and diseased limbs and branches. All cuts shall be cleanly made at their juncture with the trunk or preceding branch without injury to the trunk or remaining branches. Cuts over 1 inch in diameter shall be treated with an acceptable tree wound paint.

F. The Contractor shall restrict construction activities to those areas within the limits of construction designated on the Drawings, within public rights-of-way, and within easements provided by the Owner. Adjacent properties and improvements on these properties, public or private, which become damaged by construction operations shall be promptly restored to their original condition to the full satisfaction of the property owner.

G. The Contractor shall remove trees damaged beyond saving, through no fault of the Contractor, as directed by the Engineer.

END OF SECTION

SECTION 02240
DEWATERING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to complete the dewatering activities. All work in this Section shall be done in accordance with the requirements of the Environmental Resource Permit and Water Use Permit (if required) as issued by the Southwest Florida Water Management District (SWFWMD).

B. In addition to the requirements listed in this Section, the Contractor shall obtain, if required, and comply with all requirements of the Generic Permit for the Discharge of Ground Water From Any Non-Contaminated Site Activity as described in FAC 62-621-300.

C. Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control groundwater flow into excavations and permit construction to proceed on dry, stable subgrades.

1. Maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
2. Prevent surface water from entering excavations by grading, dikes, or other means.
3. Remove dewatering system if no longer needed.

D. The Contractor shall dewater so as to prevent damage to existing work. The Contractor shall repair or replace damage resulting from the dewatering activities promptly, remedy environmental damage as approved by the Engineer, and pay any and all fines levied to the Contractor at no additional cost or time to the Owner.

E. The Dewatering Plan shall be signed and sealed by the licensed professional engineer responsible for its preparation.

F. The Contractor shall design the dewatering system. The Contractor shall be responsible for obtaining whatever investigations are necessary, before bidding, to design the dewatering system.

1.02 SUBMITTALS

The Contractor shall submit the following in accordance with Section 01330, Submittals and Acceptance:

A. Before construction, the Contractor shall obtain a dewatering permit from the SWFWMD as required. At a minimum, the dewatering plan submitted with the dewatering application shall include the following:

1. Duration of dewatering for each area.
2. Number and size of pumps.
3. Method of dewatering each area.
4. Methods for routing/containing the discharge.
5. Methods of isolating dewatering areas.
6. Time dewatering structure will be in place.
7. Proposed discharge points.

Five copies of the plan shall be submitted to the Engineer for record purposes only.

B. The Contractor shall be responsible for determining if a Water Use Permit will be required. If a Water Use Permit is required, it is the Contractor's responsibility to obtain the required information from the Engineer and Owner to complete the Water Use Permit application to submit with the Dewatering Plan. If a Water Use Permit is required, the Contractor shall submit five copies of the application to the Owner/Engineer for submittal purposes only.

C. The Contractor shall be responsible for obtaining a Generic Permit for the Discharge of Produced Ground Water from any Non-Contaminated Site Activity as set forth in FDEP Rule 62-621.300(2), FAC. The Contractor shall obtain the required permit form 62-621.300(2) and the required information from the Engineer and Owner to complete the Generic Permit for the Discharge of Produced Ground Water from any Non-Contaminated Site Activity application to submit with the Dewatering Plan. The Contractor shall submit five copies of the application to the Owner/Engineer for submittal purposes only.

D. Provide photographs or videotape, sufficiently detailed, of existing conditions of adjoining properties, facilities, and other construction and site improvements that might be later misconstrued as damage caused by dewatering operations.

E. Submit Record Drawings at Project closeout identifying and locating utilities and other subsurface structural, electrical, or mechanical items encountered during dewatering.

1. Note locations and capping depth of wells and well points.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Administrative Code (FAC)

1. FAC 62-621-300—FDEP – Generic Permits.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with water disposal requirements of authorities having jurisdiction.

B. Pre-installation Conference: Conduct conference at the Project site to present and discuss dewatering means, methods, and monitoring program.

C. Identify a person who shall be present at all times during the execution of this portion of the Work and who shall be thoroughly familiar with the dewatering system being installed for this Project, the referenced standards, environmental and permit requirements, the requirements of this Work, and who shall direct all work performed under this Section.

D. It shall be the responsibility of the Contractor to determine the water levels before and during the dewatering work.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 QUALIFICATIONS

A. The Contractor shall provide at least one person who shall be present at all times during the execution of this portion of the Work and who shall be thoroughly familiar with the dewatering system being installed, the referenced standards, the requirements of this Work, and who shall direct all work performed under this Section.

B. The Contractor shall be responsible for determining the water level before beginning excavation and construction.

1.08 PRE-BID INSPECTION AND TESTING

A. The Contractor is advised that site soil borings may indicate groundwater levels below the levels which may occur in response to normal, seasonal, extreme, or prolonged rainfall. The Contractor is further advised that site soil borings may not necessarily represent soil conditions to be encountered elsewhere on the job site, other than at the specific boring locations.

B. Before bidding, the Contractor shall perform a detailed site inspection and, if desired, obtain the Owner's permission to perform site-specific testing as he deems necessary to obtain all required information relative to project dewatering requirements.

C. The Contractor shall include as part of his Bid the total cost of all surface and subsurface dewatering as required to construct the Project in complete compliance with the Drawings and these Specifications.

1.09 PROJECT CONDITIONS

A. The Contractor shall not interrupt utilities serving facilities occupied by the Owner or others unless approved by the Owner and Engineer and then only after arranging to provide temporary utility services according to requirements indicated.

B. A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of the geotechnical engineer and represent interpretations of subsoil conditions, tests,

and results of analyses conducted by the geotechnical engineer. The Owner will not be responsible for interpretations or conclusions drawn from these data.

1. The Geotechnical Report is included in an Appendix of these specifications.
2. Make additional test borings and conduct other exploratory operations necessary for dewatering.

C. Survey adjacent structures and improvements, employing a professional land surveyor licensed in Florida to establish exact elevations at fixed points to monitor settlement. Clearly identify monitoring points and reference vertical datum, and benchmarks. Monitor and record existing initial elevations.

1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify the Engineer if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction and existing structures.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 DEWATERING SYSTEM

A. The dewatering system shall be adequate to drain the soils to be excavated to the extent that the piezometric water level in the construction area is a minimum of 2 feet below the bottom of the excavation, side slopes of excavations, or bottom of the footings at all times, or as otherwise required to obtain the specified compaction and installation conditions. Pipeline trenches must be dewatered at least 1 foot below the trench bottom.

B. If layered soils are encountered, the hydrostatic head in the zone below the subgrade elevation shall be relieved to prevent uplift.

C. Unless otherwise noted and before any excavating below or within 2 feet above the groundwater level, a dewatering system shall be placed into operation to lower water levels to the extent specified previously and then shall be operated continuously 24 hours a day, 7 days a week, throughout the excavation to maintain and protect all work until the work has been completed to the satisfaction of the Engineer.

D. Where used, well points shall be installed in an Engineer-approved manner and in sufficient numbers to provide the necessary removal of water as stated previously.

Well points and header piping shall be installed so that traffic on public thoroughfares and site access roads will not be impeded.

E. The Contractor shall be solely responsible for the arrangement, location, and depths of the dewatering system necessary to accomplish the specified work. The dewatering system shall stay in full operation until not less than 90% of the total load is applied, as will be determined by the Engineer, or until excavations and trenches have been backfilled and compacted.

F. To prevent excessive noise, exhaust from all pumps and engines shall be silenced and muffled.

G. Wellpoint or surface water pump discharge shall be controlled to prevent erosion, undermining, and all other damage and be piped to approved locations.

H. With the Engineer's assistance, the Contractor is responsible for determining what approvals and permits are required to comply with any and all applicable regulations and permitting requirements relating to dewatering activities. With the Engineer's assistance the Contractor shall obtain all necessary approvals and permits and comply with any and all applicable regulations and permitting requirements concerning all dewatering activities, including pumpage and discharge. The Contractor is solely responsible for all costs associated with the proper implementation of dewatering activities.

I. The Contractor shall perform all dewatering work in strict compliance with Section 01350, Environmental Protection Procedures, and the Contract Drawings.

J. Excavations shall be kept free from water during the placing of concrete and for 36 hours after or until concrete forms are removed.

K. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.

1. Prevent surface water and subsurface or groundwater from entering excavations, ponding on prepared subgrades, or flooding the site and surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

L. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from the Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

M. Install sufficient dewatering equipment to drain water-bearing strata above and below the bottom of foundations. If excavating through layered soils, relieve any potential groundwater hydrostatic head in the zones below to prevent uplift.

1. Open-sump pumping which leads to loss of fines, subgrade softening, and slope instability shall not be permitted.

N. Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water in a manner that avoids flooding or accumulation on private property. Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

3.02 OBSERVATION WELLS

A. The Contractor shall install observation wells as may be required to record accurate water levels.

B. The Contractor shall be responsible for maintaining all observation wells and observing and recording the elevation of the piezometric water levels daily.

C. Wells damaged or destroyed shall be replaced at no additional cost to the Owner.

3.03 CLEANUP

A. Upon completing dewatering elsewhere on the Project, the Contractor shall remove all equipment and leave the project site in a neat, clean, and acceptable condition satisfactory to the Owner. Wellpoint holes and excavations shall be adequately backfilled and compacted to prevent settlement.

END OF SECTION

SECTION 02300
EARTHWORK FOR STRUCTURES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, equipment, tools, appliances, and materials and perform all operations necessary for the following:

1. Preparing subgrades for slab-on-grade, walks, pavements, and lawns and grasses.
2. Excavating and backfilling for buildings and structures.
3. Laying the subbase course for concrete sidewalks and pavements.
4. Excavating and backfilling for utility trenches.
5. Excavating and backfilling for trenches for buried mechanical and electrical utilities and pits for buried utility structures, as indicated on the Contract Drawings and described in this Section.

1.02 SUBMITTALS

The Contractor shall submit the following shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D2487 of each onsite and borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D1557 for each onsite and borrow soil material proposed for fill and backfill.

B. The Contractor shall submit records before the start of this work. The Contractor shall verify that the existing conditions are correct as shown on the plans and mentioned in these Specifications. The Contractor shall note any discrepancies found immediately and notify the Owner and Engineer. The records shall include the following:

1. The location of all underground utilities, structures, etc. surrounding the areas to be excavated that may be impacted by the work.
2. The location of test excavations.
3. The location of inspections.

C. Testing Agency Invoices indicating if the invoice is for an initial test or a re-test of the Contractor's work.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM C33/C33M—Standard Specification for Concrete Aggregates.
2. ASTM D698—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).
3. ASTM D1556/D1556M—Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
4. ASTM D1557—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).
5. ASTM D2167—Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
6. ASTM D2487—Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
7. ASTM D2937—Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
8. ASTM D2940/D2940M—Standard Specification for Graded Aggregate Material For Bases or Subbases for Highways or Airports.
9. ASTM D3740—Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
10. ASTM D6938—Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
11. ASTM E329—Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

B. Occupational Safety and Health Administration (OSHA)

1. OSHA 2226—Trenching and Excavation Safety.

1.04 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E329 to conduct soil materials and definition testing, as documented according to ASTM D3740.

B. The Contractor shall do the following:

1. Ensure that excavations provide adequate working space and clearance for the work to be performed and for installing piping and buried utilities. In no case shall excavation faces be undercut.
2. Ensure that foundation surfaces are clean and free of loose material of any kind when pipelines and buried utilities are placed on them.
3. Excavate, trench, and backfill in compliance with applicable requirements of governing authorities having jurisdiction.
4. Ensure that shoring and sheeting for excavations are designed by a Florida-registered Professional Engineer and are in accordance with OSHA 2226.
5. Before beginning any excavation or grading, ensure the accuracy of all survey data indicated on the Contract Drawings and in the Specifications and/or as provided. If the Contractor discovers any inaccuracies, errors, or omissions in the survey data, the Contractor shall immediately notify the Owner so that proper adjustments can be anticipated or ordered. If the Contractor begins any excavation or grading, this shall be considered an acceptance of the survey data by the Contractor, after which time the Contractor has no claim against the Owner resulting from alleged errors, omissions, or inaccuracies of the survey data.
6. Ensure that tolerances for excavation are plus or minus 0.10 foot to the required line and to the required grade. Tolerance for compaction of in-place material shall be plus or minus 0.10 foot to the required grade, unless otherwise noted.
7. Remove unsatisfactory materials and unsuitable materials including muck, silts, peat, and other loose and very loose compressible soils from excavations before placing pipe foundation, bedding, and buried utilities.

1.05 PROJECT CONDITIONS

A. Existing Utilities: The Contractor shall not interrupt utilities serving facilities occupied by the Owner or others unless permitted to do so in writing by the Engineer and then only after arranging to provide temporary utility services according to requirements indicated.

1. Notify the Engineer not less than 2 days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without the Engineer's written permission.
3. Contact a utility-locator service and obtain utility locations for the Project area before excavating.

B. The Contractor shall demolish and completely remove from the site underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

1.06 DEFINITIONS

A. *Backfill*: Soil material or controlled low-strength material used to fill an excavation.

1. *Initial Backfill*: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. *Final Backfill*: Backfill placed over initial backfill to fill a trench.

B. *Base Course*: The course placed between the subbase course and hot-mix asphalt paving.

C. *Bedding Course*: The course placed over the excavated subgrade in a trench before laying pipe.

D. *Borrow Soil*: Suitable soil imported from off site for use as fill or backfill.

E. *Drainage Course*: The course supporting the slab-on-grade that also minimizes the upward capillary flow of pore water.

F. *Excavation*: Removing material encountered above subgrade elevations and to lines and dimensions indicated.

1. *Authorized Additional Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
2. *Unauthorized Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Engineer. Unauthorized excavation as well as remedial work directed by the Engineer shall be without additional compensation.

G. *Fill*: Soil materials used to raise existing grades.

H. *Structures*: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. *Subgrade*: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

J. *Utilities*: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

PART 2 PRODUCTS

2.01 SOIL MATERIALS

A. General: The Contractor shall provide borrow soil materials when sufficient suitable soil materials are not available from excavations.

B. Suitable Soils: ASTM D2487 Soil Classification Groups SW and SP or a combination of these groups, free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsuitable Soils: Soil Classification Groups GW, GP, GM, GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, or a combination of these groups.

1. Unsuitable soils also include satisfactory soils not maintained within 2% of optimum moisture content at time of compaction.

D. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95% passing a 1-1/2-inch sieve and not more than 8% passing a No. 200 sieve.

E. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90% passing a 1-1/2-inch sieve and not more than 12% passing a No. 200 sieve.

F. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; except with 100% passing a 1-inch sieve and not more than 8% passing a No. 200 sieve.

G. Sand: ASTM C33/C33M; fine aggregate, natural, or manufactured sand.

H. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

PART 3 EXECUTION

3.01 PREPARATION

A. The Contractor shall protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. The Contractor shall prepare subgrade for earthwork operations including removing vegetation, topsoil, debris, obstructions, and deleterious materials from ground surface as specified in Section 02230, Site Preparation.

C. The Contractor shall protect and maintain erosion and sedimentation controls, which are specified in Section 01350, Environmental Protection Procedures.

3.02 DEWATERING

A. The Contractor shall prevent surface water and groundwater from entering excavations, from ponding on prepared subgrades, and from flooding the Project site and surrounding area.

B. The Contractor shall protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
2. Install a dewatering system**,** specified in Section 02240, Dewatering, to keep subgrades dry and convey groundwater away from excavations. Maintain until dewatering is no longer required.

3.03 EXPLOSIVES

A. Explosives: Do not use explosives.

3.04 EXCAVATION, GENERAL

A. Unclassified Excavation: The Contractor shall excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered.

Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsuitable soil materials, replace with suitable soil materials.

3.05 EXCAVATION FOR STRUCTURES

A. The Contractor shall excavate to indicated elevations and dimensions within a tolerance of plus or minus 0.10 foot. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb the bottom of the excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 0.10 foot. Do not disturb the bottom of excavations intended as bearing surfaces.

3.06 EXCAVATION FOR WALKS AND PAVEMENTS

A. The Contractor shall excavate surfaces under walks and pavements to indicated lines, cross-sections, elevations, and subgrades.

3.07 SUBGRADE INSPECTION

A. The Contractor shall notify the Engineer when excavations have reached the required subgrade.

B. If the Engineer determines that unsuitable soil is present, the Contractor shall continue excavation and replace with compacted backfill or fill material as directed.

C. The Contractor shall proof-roll subgrade below the building slabs and pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

1. Completely proof-roll the subgrade in one direction**,** repeating proof-rolling in the direction perpendicular to the first direction. Limit vehicle speed to 3 miles per hour (mph).

2. Excavate soft spots, unsuitable soils, and areas of excessive pumping or rutting, as determined by the Engineer, and replace with compacted backfill or fill as directed.

D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices or additional work.

E. As directed by the Engineer, the Contractor shall reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities without additional compensation.

3.08 UNAUTHORIZED EXCAVATION

A. The Contractor shall fill unauthorized excavation under foundations or wall footings by extending the bottom elevation of concrete foundation or footing to the excavation bottom without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2,500 psi, may be used when approved by the Engineer.

1. Fill unauthorized excavations under other construction or utility pipe as directed by the Engineer.

3.09 STORAGE OF SOIL MATERIALS

A. The Contractor shall stockpile excavated suitable soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water.

1. Stockpile soil materials away from edge of excavations. Do not store within the drip line of remaining trees.

3.10 BACKFILL

A. Backfill and compaction shall be according to the recommendations of the Geotechnical Report included as an Appendix to these Specifications.

B. The Contractor shall place and compact backfill in excavations promptly, but not before completing the following:

1. Constructing below finish grade, including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.

6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

C. The Contractor shall place backfill on subgrades free of mud.

3.11 SOIL FILL

A. The Contractor shall plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. The Contractor shall place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use suitable soil material.
2. Under walks and pavements, use suitable soil material.
3. Under building slabs, use engineered fill.
4. Under footings and foundations, use engineered fill.

C. The Contractor shall place soil fill on subgrades free of mud.

3.12 SOIL MOISTURE CONTROL

A. The Contractor shall uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compacting to within 2% of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy.
2. Remove and replace or scarify and air dry otherwise suitable soil material that exceeds optimum moisture content by 2% and is too wet to compact to the specified dry unit weight.

3.13 COMPACTION OF SOIL BACKFILLS AND FILLS

A. The Contractor shall place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. The Contractor shall place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. The Contractor shall compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D698:

1. Under structures, building slabs, steps, and pavements, scarify and recompact the top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95%.
2. Under walkways, scarify and recompact the top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92%.
3. Under lawn or unpaved areas, scarify and recompact the top 6 inches below subgrade and compact each layer of backfill or fill soil material at 90%.
4. For utility trenches, compact each layer of initial and final backfill soil material at 85% in unpaved lawn areas. Final backfill compaction shall meet the requirement listed above depending on the location of the trench.

3.14 GRADING

A. General: The Contractor shall uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross-sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.15 FIELD QUALITY CONTROL

A. The number and location of the tests shall be as specified in these Specifications and as directed by the Engineer during construction.

B. The Contractor shall coordinate activity with the Engineer and the testing agency to permit testing as directed in the presence of the Engineer.

C. The cost of all testing to achieve specified requirements shall be borne by the Contractor. The Contractor shall be reimbursed by the Owner for passing field tests based on the Testing Allowance pay item listed in the Contract Documents.

D. The costs of any and all retests due to failure to achieve specified requirements shall be solely borne by the Contractor and are not reimbursable under this Contract.

E. All materials proposed for use shall be tested as follows:

Material	Required Test	Min No. Tests
Suitable Soil Materials	Soil Classification using ASTM D2487 (including all tests contained therein)	One per source of materials to determine conformance with materials specified herein; additional test whenever there is any apparent change.
	Soil moisture-density relationship using Modified Proctor ASTM D1557	One per source of material or apparent change in material.

F. The Contractor shall allow the testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after the test results for previously completed work comply with requirements.

G. Footing Subgrade: At footing subgrades, the testing agency will perform at least one test of each soil stratum to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Engineer.

H. The testing agency will test compaction of soils in place according to ASTM D1556/D1556M, ASTM D2167, ASTM D2937, and ASTM D6938 as applicable. Tests will be performed at the following locations and frequencies:

1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2,000 square feet or less of paved area or building slab, but in no case fewer than three tests.
2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for each 100 feet or less of wall length but no fewer than two tests.
3. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 400 feet or less of trench length but no fewer than two tests.

I. When the testing agency reports that subgrades, fills, or backfills have not achieved the degree of compaction specified, the Contractor shall scarify and moisten or aerate or remove and replace soil to the depth required and recompact and retest until specified compaction is obtained.

J. The approved testing agency shall transmit copies of field testing results as follows:

1. One copy to the Owner.
2. Two copies to the Engineer.
3. Two copies to the Contractor.

The field test reports shall include, at a minimum, project title; project location; location of sample(s) tested; time of testing; date of testing; testing person's full name; testing agency name, address, and telephone number; and test results.

K. No soil material shall be used until (1) the Engineer has reviewed and approved test reports and (2) the Contractor submits certification that the soil material proposed for construction is clean and meets gradation and other parameters specified in this Specification.

L. At no cost to the Owner, the Contractor shall remove and replace or correct all materials and work which tests indicate do not conform, in the opinion of the Engineer, to the requirements of these Specifications.

M. The results of in-place density tests shall be considered satisfactory if the density in each instance is equal to or greater than the specified density. Soil moisture content at the time of testing shall conform to requirements of these Specifications.

N. Where unsatisfactory compaction is revealed by the tests, the Contractor shall re-excavate, backfill, recompact, and/or rework the backfill as required to obtain the required degree of compaction over the entire depth of the excavation.

O. The testing agency shall transmit to the Engineer copies of all testing agency invoices submitted to the Contractor for payment. Invoices shall clearly indicate specific services and date and time services are rendered and shall indicate if the invoiced testing cost is an initial test of the Contractor's work or is a re-test required due to the Contractor's failure to initially achieve the specified requirements.

3.16 PROTECTION

A. Protecting Graded Areas: The Contractor shall protect newly graded areas from traffic and erosion and keep them free of trash and debris.

B. The Contractor shall repair and reestablish grades to the specified tolerances where completed or partially completed surfaces become eroded, rutted, settled,

or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by the Engineer and reshape and recompact.

C. Where settling occurs before the Project Correction Period elapses, The Contractor shall remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: The Contractor shall transport surplus suitable soil to designated storage areas on the Owner's property and stockpile and spread this soil as directed by the Engineer.

1. Remove waste material, including unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.

END OF SECTION

SECTION 02305
EARTHWORK FOR UTILITIES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall provide all materials, equipment, labor, and work necessary to completely construct the project in accordance with the Contract Documents. This work includes but is not limited to the following:

1. Backfilling trenches at the end of each working day or placement of steel plates over trenches after working hours. Steel plates shall be H-20 load rated.
2. Preparing trench foundations.
3. Providing suitable material for all trenches as specified and as required.
4. Obtaining, storing, maintaining, and disposing of materials.
5. Dewatering, shoring, and sheeting.
6. Placing, compacting, testing, final grading, and subgrade demolition.
7. Performing all other work required by the Contract Documents.

B. The Contractor is responsible for performing all work so as not to damage existing roadways, facilities, utilities, structures, etc. and shall repair and replace such damage to equal or better than its original undamaged condition without cost to the Owner.

C. The Contractor shall examine the site before submitting a bid, taking into consideration all conditions that may affect the work.

D. The Contractor shall coordinate all additional subsurface investigations and testing included with this work with the Engineer before performing the excavation and foundation preparation work. In general, if the Contractor finds different and unsuitable/unsatisfactory soil conditions during the work, the Contractor shall notify the Engineer and the Owner immediately.

1.02 SUBMITTALS

The Contractor shall submit the following shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D2487 of each onsite and borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D1557 for each onsite and borrow soil material proposed for fill and backfill.

B. The Contractor shall submit records before the start of this work. The Contractor shall verify that the existing conditions are correct as shown on the plans and mentioned in these Specifications. The Contractor shall note any discrepancies found immediately and notify the Owner and Engineer. The records shall include the following:

1. Location of all existing underground utilities, structures, etc. surrounding the areas to be excavated that may be impacted by the work.
2. Location of test excavations.
3. Location of inspections.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply:

A. American Society for Testing and Materials (ASTM)

1. ASTM D1556/D1556M—Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
2. ASTM D1557—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3)).
3. ASTM D2487—Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
4. ASTM D2937—Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method.
5. ASTM D3282—Standard Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.

6. ASTM D3740—Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used In Engineering Design and Construction.
7. ASTM D6938—Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).
8. ASTM E329—Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection.

B. Florida Statutes (FL)

1. Florida Trench Safety Act (90-96, Laws of Florida).

C. Occupational Safety and Health Administration (OSHA)

1. 29 CFR 1926, Subpart P—Safety and Health Regulations for Construction, Excavations.
2. OSHA 2226—Trenching and Excavation Safety.

1.04 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E329 to conduct soil materials and definition testing, as documented according to ASTM D3740.

B. The Contractor shall do the following:

1. Ensure that excavations provide adequate working space and clearance for the work to be performed and for installing piping and buried utilities. In no case shall excavation faces be undercut.
2. Ensure that foundation surfaces are clean and free of loose material of any kind when pipelines and buried utilities are placed on them.
3. Perform excavating, trenching, and backfilling in compliance with applicable requirements of governing authorities having jurisdiction.
4. Ensure that shoring and sheeting for excavations are designed by a Florida-registered Professional Engineer and are in accordance with the OSHA 2226.
5. Before beginning any excavation or grading, ensure the accuracy of all survey data indicated on the Contract Drawings and in these Specifications and/or as provided. If the Contractor discovers any inaccuracies, errors, or omissions in the survey data, the Contractor shall immediately notify the Owner so that proper adjustments can be anticipated or ordered. If the Contractor begins any excavation or grading, this shall be considered an acceptance of the survey data by the Contractor, after which time the

Contractor has no claim against the Owner resulting from alleged errors, omissions, or inaccuracies of the survey data.

6. Ensure that tolerances for excavation are ±0.10 foot to the required line and to the required grade. Tolerance for compaction of in-place material shall be ±0.10 foot to the required grade.
7. Ensure that all trench materials derived from the project site and imported to this site are examined, tested, and classified by an Engineer-approved soils testing laboratory.
8. Remove unsuitable materials and unsuitable materials including muck, silts, peat, and other loose and very loose compressible soils from excavations before placing pipe foundation, bedding, and buried utilities.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 PROJECT CONDITIONS

A. Existing Utilities: The Contractor shall not interrupt utilities serving facilities occupied by the Owner or others unless permitted to do so in writing by the Engineer and then only after arranging to provide temporary utility services according to the requirements indicated.

1. Notify the Engineer not less than 2 days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without the Engineer’s written permission.
3. Contact a utility-locator service and obtain utility locations for the Project Area before excavating.

B. The Contractor shall demolish and completely remove from the site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

1.08 DEFINITIONS

A. *Backfill*: Soil material or controlled low-strength material used to fill an excavation.

1. *Initial Backfill*: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. *Final Backfill*: Backfill placed over initial backfill to fill a trench.

B. *Base Course*: The course placed between the subbase course and hot-mix asphalt paving.

C. *Bedding Course*: The course placed over the excavated subgrade in a trench before laying pipe.

D. *Borrow Soil*: Suitable soil imported from off site for use as fill or backfill.

E. *Drainage Course*: The course supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. *Excavation*: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. *Authorized Additional Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by the Engineer. Authorized additional excavation and replacement material will be paid for according to the Contract provisions for unit prices.
2. *Bulk Excavation*: Excavation more than 10 feet in width and more than 30 feet in length.
3. *Unauthorized Excavation*: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by the Engineer. Unauthorized excavation, as well as remedial work directed by the Engineer, shall be without additional compensation.

G. *Fill*: Soil materials used to raise existing grades.

H. *Structures*: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. *Subgrade*: The surface or elevation remaining after completing excavation, or the top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

J. *Utilities*: On-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.09 TESTING REQUIREMENTS

A. The Contractor shall furnish a soil survey for suitable material and samples of materials.

B. Testing for source material, for classification, and for prequalification of material (on or off site) shall be performed by an independent testing agency retained by the Contractor and approved by the Engineer.

C. Testing for in-place compacted fill shall be performed by the same independent testing agency as approved by the Engineer and retained by the Contractor.

D. The number and location of the tests shall be as specified in these Specifications and as directed by the Engineer during construction.

E. The Contractor shall coordinate activity with the Engineer and the testing agency to permit testing as directed in the presence of the Engineer.

F. The cost of all testing to achieve specified requirements shall be borne by the Contractor. The Contractor shall be reimbursed by the Owner for passing field tests.

G. The costs of any and all retests due to failure to achieve specified requirements shall be solely borne by the Contractor and are not reimbursable under this contract.

H. All materials proposed for use shall be tested as follows:

Material	Required Test	Min. No. Tests
Suitable Soil Materials	Soil Classification using ASTM D2487 (including all tests contained therein)	One per source of materials to determine conformance with materials specified this Specification; additional test whenever there is any apparent change.
	Soil moisture-density relationship using Modified Proctor ASTM D1557	One per source of material or apparent change in material.

I. Soil materials shall be tested during construction as follows:

Material	Required Test	Min. No. Tests
Suitable Soil Material in-place after compaction	Field Density ASTM D1556/1556M – Sand Cone Method, or ASTM D6938 – Nuclear Density Method, or ASTM D2937 – Drive Cylinder Method	For each layer of trench bottom subgrade before addition of soil materials, refill, bedding, and backfill, and for each 400 lineal feet of trench or fraction thereof, whichever is greater; two tests for each drainage, manhole, or wet well structure; additional test whenever there is any change in native soil, groundwater, or soil moisture conditions.

J. The approved testing agency shall transmit copies of required laboratory test results as follows:

1. One copy to the Owner.
2. Two copies to the Engineer.
3. Two copies to the Contractor.

The laboratory test reports shall include, at a minimum, project title; project location; location of sample; source, time, and date of testing; testing agency's name, address, and telephone number; and test results. Each test report shall be signed and sealed by the Professional Engineer representing the testing agency as specified in these Specifications.

K. The approved testing agency shall transmit copies of field testing results as follows:

1. One copy to the Owner.
2. Two copies to the Engineer.
3. Two copies to the Contractor.

The field test reports shall include, at a minimum, project title; project location; location of sample(s) tested; time of testing; date of testing; testing person's full name; testing agency name, address, and telephone number; and test results.

L. No soil material shall be used until 1) the Engineer has reviewed and approved test reports and 2) the Contractor submits certification that the soil material proposed for construction is clean and meets gradation and other parameters in these Specifications.

M. At no cost to the Owner, the Contractor shall remove and replace or correct all materials and work which tests indicate do not conform, in the opinion of the Engineer, to the requirements of these Specifications.

N. The results of in-place density tests shall be considered satisfactory if the density in each instance is equal to or greater than the specified density. Soil moisture content at the time of testing shall conform to requirements of these Specifications.

O. Where the tests reveal unsatisfactory compaction, the Contractor shall re-excavate, backfill, recompact, and/or rework the backfill as required to obtain the required degree of compaction over the entire depth of the excavation.

P. The testing agency shall transmit to the Engineer copies of all testing agency invoices submitted to the Contractor for payment. Invoices shall clearly indicate specific services and date and time services are rendered and shall indicate if the invoiced testing cost is an initial test of the Contractor's work or is a re-test required due to the Contractor's failure to initially achieve the specified requirements.

PART 2 PRODUCTS

2.01 STRUCTURAL MATERIALS

A. Materials used for shoring and bracing, such as sheet piling, uprights, stringers, and crossbraces, shall be in good serviceable condition. Any timber used shall be sound and free from large or loose knots.

B. Pressure-treated timber shall be used where wood sheeting or piling is specified or indicated to be cut and left in place.

2.02 TRENCH SOIL MATERIALS

A. Materials used for trench construction shall be free of clumps of clay, rock or gravel, debris, waste, frozen materials, and other deleterious matter as determined by the Engineer and shall be suitable soil materials as follows:

Area Classification	Soil Materials
In excavations and trenches	Excavated and borrow material that has been sampled, tested, and approved as "Suitable Soil Material."

B. Suitable Soil Materials

1. Soil Classification Groups: Suitable soil materials for each trench shall be as follows:

Suitable Soil Material (ASTM D487, Soil Classification Groups)		
In-situ Foundation	Bedding, Haunching, and Initial Backfill	Final Backfill
SW SP	SW SP	SW SP

2. Maximum Particle Size Limitations for Suitable Soil Materials: The maximum allowable particle size for suitable soil materials within each trench for each type of utility shall be as follows:

Conduit	Maximum Allowable Particle Size		
	In-situ Foundation	Bedding, Haunching, and Initial Backfill	Final Backfill
Plastic Pipe (PVC, CPVC, HDPE, etc.) less than 6-inch-diameter	See Note 1	1/2 inch	3 inches
Plastic Pipe (PVC, CPVC, HDPE, etc.) 6-inch-diameter and Larger	See Note 1	3/4 inch	3 inches
Concrete Pipe			
Steel Pipe			
Ductile Iron Pipe			
Fiberglass Pipe	See Note 1	3/4 inch or three times the wall thickness, whichever is less	3 inches
Other Conduit Materials	See Note 2	See Note 2	See Note 2

(1) There is no requirement when suitable undisturbed native soil material is used. Disturbed portions of the foundation and/or unsuitable native soil material shall be replaced with suitable soil materials meeting all the requirements for Bedding.
(2) The maximum allowable particle size shall be in accordance with the manufacturer's written recommendation.

3. Additional Requirements of Suitable Materials: Suitable soil materials shall be free of debris, waste, frozen materials, vegetation, or other deleterious matter. Soils within 4 inches of the exterior surface of the pipe shall be free of gravel, stones, or other materials which may abrade the pipe surface.

C. Unsuitable Materials

1. Unsuitable soil material shall mean ASTM D2487, Soil Classification Groups GW, GP, GM, GC, SC, CL, ML, OL, CH, MH, OH, PT, and other

highly organic soils and soil materials of any classification that have a moisture content at the time of compaction beyond the range of 1 percentage point below and 3 percentage points above the optimum moisture content of the soil material as determined by moisture-density relations test.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

The Contractor shall do the following:

A. Carefully verify by hand methods the location of all surrounding underground utilities before performing utility excavations and trenches.

B. Protect utilities to be left in place from damage.

C. Do not interrupt existing utilities serving facilities occupied and used by the Owner, except when permitted in writing by the Owner.

D. Protect benchmarks, survey points, and existing structures, roads, sidewalks, monitoring wells, paving, curbs, etc. against damage from equipment, vehicular or foot traffic, settlement, lateral movement, undermining, washout, and all construction-related activities.

E. Repair and replace damage to existing facilities to equal or better than their original undamaged condition without cost to the Owner and to the approval of the Engineer.

F. Excavate and trench in ways that will prevent surface water and subsurface water from flowing into excavations and will also prevent flooding of the site and surrounding area.

G. Protect excavations and trenching by shoring, bracing, sheet piling, underpinning, or other methods as required to prevent cave-ins or loose dirt from falling into excavations and trenches.

H. Do not operate earth-moving equipment within 5 feet of walls of concrete structures for depositing or compacting backfill material.

I. Compact the backfill material placed next to concrete walls with hand-operated tampers or similar equipment that will not damage the structure.

J. Excavate, fill, backfill, and grade to elevations required by the Contract Documents.

K. Pile excavated materials suitable for backfill in an orderly manner a sufficient distance from excavations to prevent overloading, slides, and cave-ins.

L. Do not obstruct access ways, roadways, and plant facilities.

M. Dewater excavations and trenches in accordance with Section 02240, Dewatering.

N. Refer to the Contract Drawings for additional requirements related to earthwork and protection of existing features.

3.02 TRENCH EXCAVATION

A. Before excavating the trench, the Contractor shall prepare the surface, including clearing and grubbing as specified in Section 02230, Site Preparation.

B. The Contractor shall be required to fully comply with all applicable OSHA Excavation Safety Standards and to abide by them as covered by the most current version of the Florida Trench Safety Act (90-96, Laws of Florida).

C. The Contractor shall ensure that mechanical equipment used for trench excavation shall be of a type, design, and construction and shall be so operated that conduit/ utility, when accurately laid to specified alignment, will be centered in the trench with adequate clearance between the conduit/utility and sidewalls of the trench. Undercutting the trench sidewall to obtain clearance will not be permitted.

D. The Contractor shall not use mechanical equipment in locations where its operation would cause damage to trees, buildings, culverts, other existing property, utilities, structures, etc. above or below ground. In all such locations, the Contractor shall use hand excavating methods.

E. The Contractor shall not use blasting.

F. The Contractor shall cut trenches sufficiently wide to enable proper installation of services and to allow for testing and inspection. The Contractor shall also trim and shape trench bottoms and leave them free of irregularities, lumps, and projections. Trench width shall be excavated as specified on the Contract Drawings.

G. The Contractor shall construct trench walls so as to avoid side wall collapse or sloughing. Trenches shall be either braced or open construction in accordance with the Contract Documents. No separate payment will be made for any special procedure used in connection with the excavation.

H. Where sheeting and bracing are not required, the Contractor shall construct trench walls in the bottom of the excavation as vertical as possible to the maximum height allowable by OSHA. Trench walls above this height shall be sloped to guard against side wall collapse or sloughing as specified on the Contract Drawings.

I. Where sheeting and bracing are required, the sheeting and bracing system shall meet the requirements specified in these Specifications.

J. Excavations shall be to the design elevations shown on the Contract Drawings or as specified, unless unsatisfactory or unsuitable foundation materials are encountered in the bottom of the excavation. Where unsatisfactory or unsuitable foundation materials are encountered, this material shall be undercut and removed as indicated on the Contract Drawings and replaced with suitable soil material meeting all the requirements for Bedding. The lift thicknesses and compaction requirements for the replacement soil shall also meet the requirements for Bedding.

K. The Contractor shall be careful not to overexcavate except where necessary to remove unsatisfactory or unsuitable materials, irregularities, lumps, rock, and projections. Unnecessary overexcavation shall be replaced as specified in these Specifications at the Contractor's sole expense.

L. The Contractor shall accurately grade bedding soil materials at the bottoms of the trenches to provide uniform bearing and support for each section of conduit/utility at every point along its entire length except where it is necessary to excavate the bedding for conduit/utility bells (e.g., pipe bells), etc. or for proper sealing of conduit/utility joints. Abrupt changes in grade of the trench bottom shall be avoided.

M. The Contractor shall dig bell holes and depressions after the bedding has been graded to ensure that the conduit/utility rests on the prepared bedding for as much of its full length as practicable. Bell holes and depressions shall be only of such length, depth, and width as required to make the joint.

N. The Contractor shall do the following:

1. Pile all excavated material in a manner that will not endanger the work or erode the stormwater management facilities or water courses.
2. Avoid obstructing sidewalks, driveways, and plant facilities.
3. Leave hydrants, valve pit covers, valve boxes, or other utility controls unobstructed and accessible.

4. Keep gutters, drainage inlets, natural water courses, and miscellaneous drainage structures clear or make other satisfactory provisions for their proper operation.

O. The Contractor shall keep all suitable materials that are suitable for use/reuse in the trench construction separated from unsuitable materials.

P. Except where otherwise authorized, indicated, or specified, the Contractor shall replace, at the Contractor's own expense, all materials excavated below the bottom of concrete walls, footings, slabs on grade, and foundations with concrete or flowable fill, as directed by the Engineer.

Q. The Contractor shall adhere to these Additional Excavation Requirements for piping:

1. Excavate trenches so that the piping can be laid to the lines, grades, and elevations indicated on the Contract Drawings.

2. For piping designated to be laid to a minimum cover requirement, grade trenches to avoid high and low points to the extent practical. Record Drawings of such pipes shall present top-of-pipe and grade elevations at all high and low points along each pipe segment, at the end points of each pipe segments, and at intervals not to exceed 100 feet along each pipe segment. If, in the opinion of the Engineer, additional air release and/or vacuum relief valves are required, the Contractor shall install the additional items as directed by the Engineer.

3. Except at locations specifically indicated otherwise on the Contract Drawings, the required minimum cover over the top of the pipe from finished grade for various pipe diameters shall be as follows:

	Pipe Diameter			
	48 inch or less	66 inch	72 inch	96 inch
Minimum Cover	3 feet	4 feet	4.5 feet	5 feet

Continue dewatering operations along each pipe segment until the required minimum cover is provided. During the dewatering operations, the groundwater level in the trench shall remain at all times a minimum of 1 foot below bottom of trench excavations.

R. The Contractor shall adhere to these Additional Excavation Requirements for Electrical Utilities:

1. Avoid abrupt changes in grade of the trench bottom.

2. The required minimum cover over the top of electrical conduits from finished grade shall be as follows:

	Electrical Conduits (Lines less than 5 kV)	Electrical Conduits (Lines 5 kV and up)
Minimum Cover	2 feet	3 feet

3. The required minimum clearance from the bottom of mat foundations and/or footings shall be 2 feet. Provide additional cover where necessary to satisfy the minimum clearance requirement.

4. Provide additional cover depth if necessary to avoid interference of other cables, ducts, piping, structures, and other utilities.

S. The Contractor shall adhere to this Additional Excavation Requirement for Appurtenances:

1. Ensure that excavations for valves and similar appurtenances shall be sufficient to leave at least 12 inches in the clear between the outer surfaces and the embankment or timber used to hold and protect the walls.

3.03 PROTECTION OF PERSONS AND PROPERTY

A. The Contractor shall do the following:

1. Barricade and post excavations with warning signs for the safety of persons. Provide warning lights during hours of darkness.
2. Protect structures, utilities, sidewalks, pavements, and other facilities immediately adjacent to excavations against damage, including loading, settlement, lateral movement, undermining, and washout.

B. Conduct topsoil removal operations to ensure the safety of persons and to prevent damage to existing structures and utilities, construction in progress, trees and vegetation to remain standing, and other property.

3.04 SHEETING AND BRACING

A. Where sheeting and bracing are required to support the side walls of the excavation, the Contractor shall retain a Professional Engineer, registered in Florida, to design sheeting and bracing. The design shall establish requirements for sheeting and bracing and shall comply with all applicable codes; authorities having jurisdiction; and federal, state, and local regulations.

B. The sole responsibility for the design, methods of installation, and adequacy of sheeting and bracing shall be and shall remain that of the Contractor and the Contractor's Professional Engineer. The Contractor shall provide all necessary sheeting and bracing or other procedures as required to ensure safe working conditions and to protect the excavations.

C. Sheeting and bracing shall consist of braced steel sheet piling, trench box, braced wood lagging, and soldier beams or other approved methods.

D. The Contractor shall immediately fill and compact voids formed outside the sheeting. Where soil cannot be properly compacted to fill the void, the Contractor shall use Class B concrete as backfill at no additional cost to the Owner.

E. The Contractor shall install sheeting outside the required clearances and dimensions. Sheeting shall be plumb, securely braced, and tied in position. Sheeting shall be adequate to withstand all pressure to which it may be subjected. The Contractor shall correct any movement or bulging at no expense to the Owner so as to provide the necessary clearances and dimensions.

F. The Contractor shall maintain sheeting and bracing in excavations and trenches for the entire time excavations will be open.

G. The Contractor shall not brace sheeting against pipe being laid. Sheeting shall be braced so that no concentrated load of horizontal thrust is transmitted to the pipe.

3.05 DEWATERING, WATER REMOVAL, AND DRAINAGE MAINTENANCE

A. Water shall not be permitted to accumulate in excavations. The Contractor shall provide dewatering systems to convey water away from excavations so that softening of foundations bottoms, footing undercutting, and soil changes detrimental to subgrade stability and foundation will not occur. Dewatering systems and methods of disposal shall be as specified in Section 02240, Dewatering, and as approved by the Engineer before being installed by the Contractor. Groundwater levels shall be maintained a minimum of 1 foot below bottom of trenches or excavations.

B. Dewatering systems and equipment shall be in place as required to eliminate water during the excavation period until the work is completed. The Contractor shall provide ample means and equipment with which to remove promptly and dispose of properly all water entering any excavation. This includes the use of sand or gravel as required to maintain adequate flow during the pipe laying or installation of other items of work within the excavation.

C. The Contractor shall dispose of water pumped or drained in a suitable manner without damage to adjacent property, to other work under construction, or to roads. Water shall not be discharged onto surface improvements without adequate protection of the surface at the point of discharge. All gutter, drains, culverts, sewers, and inlets shall be kept clean and open for surface drainage. Water shall not be directed across or over pavements except through approved pipes or properly constructed troughs. The Contractor shall obtain permission from the Owner of any property involved before constructing water courses or installing discharge pipe or hose for removal of water and provide for disposal of the water without ponding or creating a public nuisance.

D. All pumps used for dewatering shall have noise-reduction features and shall be able to run continuously with minimal attendance. If required by the Owner or Engineer, the pumps shall be enclosed on all sides with a plywood enclosure with padded material suitable for outdoor conditions on the inside of the enclosure to further reduce pump engine noise to an acceptable level. All applicable ordinances and codes for noise abatement shall be followed. The Contractor shall maintain pumps at all times, as necessary. When pumps are no longer required, the Contractor shall remove the pumps, wellpoints, pipes, and other apparatus from the area.

E. It is essential that the discharge of the trench dewatering pumps be conducted to natural drainage channels, drains, or storm sewers.

F. Trenches shall be constructed on the upstream side of the traffic way across roadways, driveways, or other traffic ways adjacent to drainage ditches or water to prevent impounding water after the pipe has been laid. The Contractor shall construct and maintain bridges and other temporary structures required to maintain traffic across such unfilled trenches. Backfilling shall be done so that water will not accumulate in unfilled or partially filled trenches. After backfilling is completed, the Contractor shall immediately remove all material deposited in roadway ditches or other water courses crossed by the line of trench and restore the original section, grades, and contours of ditches or water courses. Surface drainage shall not be obstructed longer than necessary.

G. Where trenches are constructed in ditches or other water courses, backfill shall be protected from surface erosion. Where the grade of the ditch exceeds 1%, the Contractor shall install ditch checks. Unless otherwise indicated on the Contract Drawings, ditch checks shall be concrete or as otherwise approved by the Engineer. Ditch checks shall extend not less than 2 feet below the original ditch or water course bottom for the full bottom width and at least 18 inches into the side slopes and shall be at least 12 inches thick.

3.06 BACKFILLING AND COMPACTION

A. Backfill and compaction shall be according to the recommendations of the Geotechnical Report provided as an Appendix to these Specifications.

B. The Contractor shall not backfill trenches until required tests are performed.

C. Trenches improperly backfilled shall be reopened to the depth required for proper compaction, then refilled and compacted as specified, or the condition shall be otherwise corrected as directed.

D. The Contractor shall perform the following steps to ensure compaction at the bottom of the trench or excavation before bedding:

1. Remove disturbed native soil material and/or any soils not meeting the requirement of suitable soil material as indicated on the Contract Drawings.
2. Compact the bottom of the trench excavation (undisturbed native subsurface soil) to no less than 95% of the Modified Proctor maximum dry density in accordance with ASTM D1557, before placement of foundation, bedding, piping, and backfill.

E. To backfill below and around pipe to the spring line of the pipe, the Contractor shall do the following:

1. Construct foundation and bedding as indicated on the Contract Drawings before placement of pipe.
2. Install each pipe at proper grade, alignment, and final position.
3. Deposit suitable soil material uniformly and simultaneously on each side of pipe in completed course layers to prevent lateral displacement.
4. Compact under pipe haunches and on each side of pipe to the pipe spring line as shown on the Contract Drawings to hold the pipe in the proper position during subsequent pipe backfilling and compaction operations.
5. Construct haunching as indicated on the Contract Drawings.

F. To trench backfill above pipe spring line to finished grade, the Contractor shall do the following:

1. Deposit suitable soil material around and above pipe in uniform layers as shown on the Contract Drawings.
2. Backfill and compact trenches from the spring line of the pipe to the top of the trench in completed course layers as shown on the Contract Drawings.

3. Use material previously defined in these Specifications as suitable soil material.
4. Compact by hand or mechanical tampers.

3.07 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. The Contractor shall remove and legally dispose of waste materials, including excavated material classified as unsuitable soil material, trash, and debris from the property at no additional cost to the Owner.

END OF SECTION

SECTION 02370
EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall take every reasonable precaution throughout construction to prevent the erosion of soil and the sedimentation of streams, bays, storm systems, or other water impoundments, ground surfaces, or other property as required by federal, state, and local regulations.

B. The Contractor shall provide protective covering for disturbed areas upon suspension or completion of land-disturbing activities. Permanent vegetation shall be established at the earliest practicable time. Temporary and permanent erosion-control measures shall be coordinated to ensure economical, effective, and continuous erosion and siltation control throughout the construction and post-construction period.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Department of Transportation (FDOT)

1. FDOT Section 103—Temporary Work Structures.
2. FDOT Section 104—Prevention, Control, and Abatement of Erosion and Water Pollution.
3. FDOT Section 530—Revetment Systems.
4. FDOT Section 982—Fertilizer.
5. FDOT Section 985—Geosynthetic Materials.

1.04 REGULATORY REQUIREMENTS

A. The Contractor shall prevent damage to properties outside the construction limits from siltation due to construction of the project and assume all responsibilities to the affected property owners for correction of damages which may occur. Erosion-control measures shall be performed conforming to the requirements of and in accordance with plans approved by applicable state and local agencies and as specified by the erosion-control portion shown on the Drawings and as required by these Specifications. The Contractor shall not allow mud and debris to accumulate in the streets or enter drainage ditches, canals, or waterways. Should the Contractor pump water from excavations during construction, appropriate siltation preventative measures shall be taken before the pumped water is discharged into any drainage ditch, canal, or waterway.

1.05 PRACTICES

The Contractor shall adhere to the following:

A. Avoid dumping soil or sediment into any stream bed, pond, ditch, or watercourse.

B. Maintain an undisturbed vegetative buffer where possible between a natural watercourse and trenching and grading operations.

C. Avoid equipment crossings of streams, creeks, and ditches where practicable.

1.06 EROSION AND SEDIMENT-CONTROL DEVICES AND FEATURES

A. The Contractor shall construct all devices (silt fences, retention areas, etc.) for sediment control at the locations required to protect federal, state, and local water bodies and water courses and drainage systems before beginning to excavate the site. All devices shall be properly maintained in place until a structure or paving makes the device unnecessary or until directed to permanently remove the device.

B. The Contractor shall use mulch to temporarily stabilize areas subject to excessive erosion and to protect seed beds after planting where required.

C. Filter fabric, hay bales, or other approved methods shall be placed and secured over the grates of each existing inlet, grating, or storm pipe opening near the area of excavation to prevent silt and debris from entering the storm systems.

D. The Contractor shall use silt fences, hay bales, and floating turbidity barriers as shown on the plans or as directed by the Owner or Owner’s Representative to restrict movement of sediment from the site.

E. The Contractor shall establish vegetative cover on all unpaved areas disturbed by the work.

PART 2 PRODUCTS

2.01 GENERAL

A. Open-mesh biodegradable mulching cloth.

B. Fertilizer shall be 10-10-10 grade or equivalent.

C. Lime shall be Dolomitic Agricultural Ground limestone, in accordance with FDOT Section 982.

D. Grass shall be in accordance with Section 02920, Seeding and Sodding.

E. Silt fence shall consist of non-biodegradable filter fabric (Trevira, Mirafi, etc.), in accordance with FDOT Section 985, wired to galvanized wire mesh fencing and supported by wood or metal posts.

F. Floating or staked turbidity barriers as specified in FDOT Section 985 and FDOT Section 104.

G. Erosion Stone: FDOT Section 530.

1. Sand-Cement Riprap.
2. Concrete Block.
3. Rubble 20 to 300 pounds each.

H. Filter Fabric for placing under Riprap shall meet the requirements of FDOT Section 985.

I. Baled hay or straw in accordance with FDOT Section 104.

PART 3 EXECUTION

3.01 CLEARING

A. The Contractor shall schedule and perform clearing and grubbing so that subsequent grading operation and erosion-control practices can follow immediately after. Excavation, borrow, and embankment operations will be conducted as a continuous operation. All construction areas not otherwise protected shall be planted with permanent vegetative cover within 30 working days after completing active construction.

3.02 STABILIZING

A. The angle for graded slopes and fills shall be no greater than the angle that can be retained by vegetative cover or other adequate erosion-control devices or structures. All disturbed areas outside of embankment left exposed will, within 30 working days of completion of any phase of grading, be planted or otherwise provided with either temporary or permanent ground cover, devices, or structures sufficient to restrain erosion.

3.03 REGULATORY REQUIREMENTS

A. Whenever land-disturbing activity is undertaken on a tract, a ground cover sufficient to restrain erosion must be planted or otherwise provided within 30 working days on that portion of the tract upon which further active construction is to be undertaken.

B. If any earthwork is to be suspended for any reason for longer than 30 calendar days, the areas involved shall be seeded with vegetative cover or otherwise protected against excessive erosion during the suspension period. Suspension of work in any area of operation does not relieve the Contractor of the responsibility to control erosion in that area.

3.04 VEGETATIVE COVER

A. Preparation of Seedbed. Areas to be seeded shall be scarified a depth of 4 inches until a firm, well-pulverized, uniform seedbed is prepared. Fertilizer shall be applied during the scarification process in accordance with the following rates:

1. Fertilizer—10 to 15 pounds per 1,000 square feet.

B. Seeding. Disturbed areas along embankments shall be permanently seeded with mix specified in Section 02920, Seeding and Sodding.

C. The Contractor shall mulch all areas immediately after seeding. Mulch shall be applied and anchored as specified previously in this Section.

3.05 MAINTENANCE

A. The Contractor shall maintain all temporary and permanent erosion-control measures in functioning order. Temporary structures shall be maintained until such time as vegetation is firmly established and grassed areas shall be maintained until completion of the project. Areas which fail to show a suitable stand of grass or which are damaged by erosion shall be immediately repaired. No additional

payment will be made to the Contractor for re-establishing erosion-control devices, which may become damaged, destroyed, or otherwise rendered unsuitable for their intended function during the construction of the project.

B. The Contractor shall remove all silt, sediment, and debris buildup regularly to maintain functioning storm systems and erosion-control devices.

3.06 REMOVAL OF SEDIMENT CONTROL DEVICES

A. Near completion of the project, when directed by the Engineer, the Contractor shall dismantle and remove the temporary devices used for sediment control during construction. All erosion-control devices in seeded areas shall be left in place until the grass is established. The Contractor shall seed areas around devices and mulch after removing or filling temporary control devices.

B. The Contractor shall clean up all areas at the completion of the project.

END OF SECTION

SECTION 02700
EARTHWORK, PAVING, AND MARKINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to provide for the construction of all pavement and work related to roadways where indicated on the Drawings.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Limerock material submittal is to be made to include liquid limit, plastic index, gradation, certification regarding deleterious material, limerock bearing ratio (LBR), Florida Department of Transportation (FDOT) pit number, and other information as required to indicate performance in accordance with the specifications.

B. Information regarding asphaltic concrete materials and mix shall be submitted as required by the referenced FDOT specifications.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time, unless otherwise noted. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. The latest edition of the *FDOT Standard Specifications for Road and Bridge Construction* (Standard Specifications) and Roadway and Traffic Design Standards shall be referred to for construction, workmanship, and quality control as specified with exceptions as noted in this Section.

1. Where the referenced FDOT Specifications cite "the Department," this shall be modified to “the Owner and/or Engineer” by this Contract.
2. The Contractor shall retain an independent testing agency, as approved by the Engineer, to perform all tests, including tests referenced to be performed by the Engineer.
3. Payment for this project is in accordance with the Bid Form.

B. American Society of Testing and Materials (ASTM)

1. ASTM D1556/D1556M—Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method.
2. ASTM D1557—Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).
3. ASTM D2167—Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
4. ASTM D6938—Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth).

1.04 QUALITY ASSURANCE

A. The Contractor shall perform field-density tests along the centerline of construction or as directed by the Engineer and in accordance with the FDOT's *Standard Specifications for Road and Bridge Construction*, latest edition, FDOT Standard.

B. The Contractor shall field check the depth of stabilization and/or limerock at each road crossing with a pipeline.

C. The Engineer may require additional testing as deemed necessary. The Engineer shall interpret test results and the Contractor shall perform remedial work as directed by the Engineer. The Contractor shall provide labor to the Engineer for help in performing tests and/or checking line and grade at no additional cost to the Owner.

D. Laboratory maximum dry density of soil mixtures at optimum moisture shall be determined by ASTM D1557 for subgrade, stabilized subgrade, and limerock base course.

E. Field density of stabilized subgrade and soils or soil mixtures in fill or backfill shall be determined by ASTM D1556/D1556M, D2167, or D6938 for limerock base course.

F. Bearing value of stabilized subgrade shall be determined by the methods required for determining limerock bearing ratio (LBR) according to the FDOT, Standard Specification FM 5-515.

G. Field density of stabilized subbase shall be 98% or greater of the Modified Proctor maximum dry density, ASTM D1557.

H. Field density of limerock base course shall be 98% or greater of the Modified Proctor maximum dry density, ASTM D1557.

I. The Engineer shall have sole responsibility for interpreting all test results. The Contractor shall bear the cost of all retests due to failure to achieve specified requirements.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING (NOT USED)

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 PRODUCTS

2.01 GENERAL (NOT USED)

2.02 ROCK BASE

A. The following sections of the Standard Specifications shall apply:

1. Section 200-1, Description.
2. Section 200-2, Materials.

2.03 STABILIZING MATERIALS

A. The following sections of the Standard Specifications shall apply:

1. Section 160-1, Description.
2. Section 160-2, Materials.

2.04 PRIME AND TACK COATS FOR BASE COURSES

A. The following sections of the Standard Specifications shall apply:

1. Section 300-1, Description.
2. Section 300-2, Materials.

2.05 ASPHALT

A. The following sections of the Standard Specifications shall apply:

1. Superpave Asphalt Concrete:

a. Section 334-1, Description.
b. Section 334-2, Materials.
c. Section 334-3, General Composition of Mixture.
d. Section 334-5, Acceptance of the Mixture.

2. Asphalt Concrete Friction Courses:

a. Section 337-1, Description.
b. Section 337-2, Materials.
c. Section 337-3, General Composition of Mixes.
d. Section 337-4, Mix Design.
e. Section 337-6, Acceptance of the Mixture.

2.06 RAISED RETROREFLECTIVE PAVEMENT MARKERS

A. The following sections of the Standard Specifications shall apply:

1. Section 706-1, Description.
2. Section 706-2, Materials.

2.07 TRAFFIC STRIPES AND MARKINGS

A. The following sections of the Standard Specifications shall apply:

1. Painted Pavement Markings:

a. Section 710-1, Description.
b. Section 710-2, Materials.

2. Thermoplastic Pavement Markings:

a. Section 711-1, Description.
b. Section 711-2, Materials.

PART 3 EXECUTION

3.01 EXCAVATION AND EMBANKMENT

A. The following sections of the Standard Specifications shall apply:

1. Section 120-1, Description.
2. Section 120-2, Classifications of Excavation.
3. Section 120-3, Preliminary Soils Investigation.
4. Section 120-4, Removal of Unsuitable Materials and Existing Roads.
5. Section 120-5, Disposal of Surplus and Unsuitable Material.
6. Section 120-6.1, Materials for Borrow.
7. Section 120-7, Materials for Embankment.
8. Section 120-8, Embankment Construction.
9. Section 120-9, Compaction Requirements.
10. Section 120-10, Acceptance Program.
11. Section 120-11, Maintenance and Protection of Work.
12. Section 120-12, Construction.

B. Exceptions

1. Section 120-4.1, Subsoil Excavation: Unsuitable soils shall be those in Classifications A-6, A-7, or A-8 in the American Association of State Highway and Transportation Officials (AASHTO) System.
2. Section 120-4.2, Construction Over Existing Old Road: Where removal of existing pavement is called for, it shall be removed to the full depth as indicated in the cross-sections and replaced with new limerock and paving or other treatment in accordance with the Drawings and details.
3. Section 120-5.2, Disposal of Muck on Side Slopes: Disposing of muck on side slopes shall not apply.
4. Section 120-9.2.1, General: Laboratory maximum dry density shall be determined by Modified Proctor, ASTM D1557. Field densities shall be determined by ASTM D1556/D1556M, D2167, or D6938. All embankments shall be compacted to not less than 95% of the maximum dry density, as determined by modified Proctor, ASTM D1557.
5. Section 120-12.1, Construction Tolerances: No tolerance greater than 0.1-foot above or below the plan cross-section will be allowed.

3.02 STABILIZING

A. The following sections of the Standard Specifications shall apply:

1. Section 160-3, Construction Methods.
2. Section 160-4, Acceptance Program.

B. Exceptions

1. Section 160-2.4, Granular Subbase: The Contractor may not substitute 6 inches of Granular Subbase for 12 inches of Stabilization unless such substitution is specifically indicated on the Drawings.
2. Section 160-4.2.1.2, Undertolerance in Bearing Value Requirements: no undertolerance will be acceptable.

3.03 LIMEROCK BEARING RATIO AND DENSITIES

A. Stabilized finish grade and stabilized shoulders shall have a minimum Limerock Bearing Ration (LBR) value of 40.

B. Field density of stabilized finished grade shall be a minimum of 98% of the Modified Proctor maximum dry density as specified in ASTM D1557 to a minimum depth of 12 inches as shown on the Drawings.

3.04 PRIME AND TACK COATS

A. The following sections of the Standard Specifications shall apply:

1. Section 300-3, Equipment.
2. Section 300-5, Cleaning Base and Protection of Adjacent Work.
3. Section 300-6, Weather Limitations.
4. Section 300-7, Application of Prime Coat.
5. Section 300-8, Application of Tack Coat.

3.05 ROCK BASE

A. The following sections of the Standard Specifications shall apply:

1. Section 200-3, Equipment.
2. Section 200-4, Transporting Rock.
3. Section 200-5, Spreading Rock.
4. Section 200-6, Compacting and Finishing Base.
5. Section 200-7, Acceptance Program.
6. Section 200-8, Priming and Maintaining.

B. Exceptions

1. Section 200-7.2.1, Density: The minimum density which will be acceptable for paved areas will be 98% of the maximum dry density as determined by Modified Proctor, ASTM D1557.

2. Section 200-7.3.1.2, Depth and Surface Testing Requirements: Thickness of base shall be measured at intervals not to exceed 200 feet.

3.06 ASPHALT

A. The following sections of the Standard Specifications shall apply:

1. Hot Mix Asphalt – Plant Methods and Equipment:

a. Section 320-6, Preparation of the Mixture.
b. Section 320-7, Transportation of the Mixture.

2. Hot Mix Asphalt – General Construction Requirements:

a. Section 330-1, Description.
b. Section 330-2, Quality Control (QC) Requirements.
c. Section 330-3, Limitations of Operations.
d. Section 330-4, Surface Preparation.
e. Section 330-5, Paving Equipment.
f. Section 330-6, Placing Mixture.
g. Section 330-7, Compacting Mixture.
h. Section 330-8, Joints.
i. Section 330-9, Surface Requirements.
j. Section 330-10, Protection of Finished Surface.

B. The Engineer reserves the right to test any portion of the roadway at any time.

C. Asphalt spread rate, tack, and temperature will be kept by the person responsible for quality control, and may be checked by the project's resident observer at any time.

3.07 PAVEMENT REPAIR

A. At his own expense the Contractor shall repair all damage to pavement as a result of work under this Contract in a manner satisfactory to the Engineer. Pavement shall be repaired to match the original surface material thickness and original grade. However, the asphalt concrete thickness shall not be less than 2 inches. The repair shall include preparing the subgrade, placing and compacting the applicable base, priming the limerock base, and placing and maintaining the surface treatment as specified in this Section.

B. The width of all repairs shall extend at least 12 inches beyond the limit of the damage. The edge of the pavement to be left in place shall be cut to a true edge with a saw or other approved method so as to provide a clean edge to abut the

repair. The line of the repair shall be reasonably uniform with no unnecessary irregularities.

3.08 JOINTS

A. General pavement joints within asphalt or concrete driveways and roadways and where specified or directed by the Engineer, shall be mechanically sawed butt joints. The edges of asphalt pavement shall be trimmed to straight lines which a roller can follow or formed.

3.09 RAISED RETROREFLECTIVE PAVEMENT MARKERS

A. The following sections of the Standard Specifications shall apply:

1. Section 706-3, Equipment.
2. Section 706-4, Application.
3. Section 706-5, Contractor's Responsibility for Notification.

3.10 TRAFFIC STRIPES AND MARKINGS

A. The following sections of the Standard Specifications shall apply:

1. Painted Pavement Markings:

    a. Section 710-3, Equipment.
    b. Section 710-4, Application.
    c. Section 710-5, Tolerances in Dimensions and in Alignment.
    d. Section 710-6, Contractor's Responsibility for Notification.
    e. Section 710-7, Protection of Newly Painted Pavement Markings.

2. Thermoplastic Pavement Markings:

    a. Section 711-3, Equipment.
    b. Section 711-4, Application.
    c. Section 711-5, Contractor's Responsibility for Notification.
    d. Section 711-6, Protection of Newly Applied Traffic Stripes and Markings.

END OF SECTION

SECTION 02740
DIRECTIONAL DRILLING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes furnishing all labor, materials, equipment, and incidentals necessary to complete each directional drill installation shown on the Drawings and as specified herein.

1.02 SUBMITTALS

The following shall be submitted in sufficient detail to show full compliance with the specification:

A. Qualifications: Submit statement of qualifications and records of previous similar jobs.

B. Product Pipe: Submit manufacturer's catalog data for the product pipe as required in the pipe specifications. The product data shall also include the dimension ratio, minimum allowable bending radius, and the safe pull force for each product pipe being installed by directional drill.

C. Drilling Fluids: Submit a complete list of all drilling fluids, additives, and mixtures to be used along with Material Safety Data Sheets.

D. Software: Submit indication of the software that the Contractor will use to perform analyses in accordance with Article 1.03, Quality Assurance.

E. Analyses: Submit software analyses results in accordance with Article 1.03, Quality Assurance.

F. Contingency Plan: Submit a hydraulic fracture (frac-out) contingency plan in accordance with Article 1.03, Quality Assurance.

G. Equipment: Submit a description of the rig(s) proposed for the project at each location, showing the method of control of the boring head, head type, pulling force of the equipment, age, reamer type(s), manufacturer type, and other germane information. This information shall demonstrate that the equipment pulling force is at least 1.25 the maximum calculated peak-pulling requirement.

H. Certificates: Submit statement that the Contractor has inspected the drill equipment including the drill rod and determined that they are in satisfactory condition for its intended use.

I. Bore Plan: The Contractor shall submit a signed-and-sealed bore plan before commencing drilling activities.

J. Record Drawings: Submit an electronic copy and three hard copies of the record drawings within 5 days after completing the pull back in accordance with the Article 1.06, Record Drawings.

K. Drilling Logs: Maintain and submit upon completion of work complete drilling logs of guided directional drill operations.

1.03 QUALITY ASSURANCE

A. The proposed product pipe installation lengths, depths, and curvatures presented on the Drawings are for bidding purposes only. The Contractor shall be solely responsible for the successful installation of each product pipe. The Contractor shall analyze each installation and make modifications necessary to successfully install each product pipe.

B. The Contractor shall analyze each installation using BoreAid ™, DrillPath ™, or other approved software and perform hand calculations as necessary if the Contractor's software is not capable performing all of the required analyses. The results of the analyses/calculations shall be submitted and shall include as a minimum the following:

1. Proposed entry and exit angles.
2. Proposed radii of curvature for all directional changes.
3. Proposed profile and drill path. The profile shall show ground surfaces, waterway bottoms/beds (if applicable), and proposed product pipe installation.
4. Product pipe deflection, buckling, external pressure, and stress calculations demonstrating that the forces/stresses exerted on the product pipe during and after installation will not exceed 80% of the manufacturer's safe limits.
5. Pull back force calculations demonstrating that peak pulling requirement does not exceed 80% of the manufacturer's safe pull pack force.
6. Maximum borehole pressure calculations and demonstration that the maximum borehole pressure will not result in a hydraulic fracture (frac-out).
7. Method of buoyancy control (if required/used) to reduce forces/stresses exerted on the product pipe.

C. The Contractor shall submit a frac-out contingency plan that describes frac-out planning, prevention, monitoring, response, notification to the Owner, Engineer, and regulatory agencies, and cleanup procedures.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Delivery, storage, and handling shall be in accordance with Section 01650, Delivery, Storage, and Handling, and the additional requirements herein.

B. Inspect materials delivered to the site for damage. All materials found during inspection or during the progress of work to have cracks, flaws, surface abrasions, or other defects shall be rejected and removed from the job site.

C. Disposal of fluids is the responsibility of the Contractor. Disposal of fluids shall be done in a manner that is in compliance with all permits and applicable federal, state, and local regulations.

1.05 QUALIFICATIONS

A. The Contractor's superintendent and driller assigned to this project must be experienced in work of this nature and must have successfully completed a minimum of five similar projects of similar length, pipe type, pipe size, and soil type using directional drilling in the last 3 years. Conventional open-trenching experience or bore-and-jacking experience will not be acceptable substitutes for directional drilling experience.

B. As part of the bid submission, the Contractor shall submit documentation of such project(s). The documentation for experience shall include but not be limited to the following:

1. Name(s) and description(s) of project(s).
2. Résumés of project manager, superintendent, and driller assigned to the specific project.
3. Pipe type(s), diameter(s), and lengths.
4. Type and manufacturer of equipment used.
5. Soil conditions encountered.
6. Start and completion dates.
7. Contact names, numbers, and addresses.

1.06 RECORD DRAWINGS

A. The record drawings shall include a plan, profile, and all information recorded during the progress of the work. The Record Drawings shall be tied to the project's survey control.

1.07 DEFINITIONS

A. *Horizontal Directional Drilling (HDD):* A steer-able system for the underground installation of pipes, conduits, and cables using a surface launched rig. A pilot bore is drilled using a rotating drill string and then is enlarged by a back reamer to the size required for the product pipe. The necessary deviation during pilot boring is provided by a slanted face to the drill head, an asymmetric drill head, eccentric fluid jets, or a combination of these, usually in conjunction with an aboveground electronic locator or a remote guidance system.

B. *Maxi (Conventional) HDD*: Typically used for the largest-diameter pipelines/ conduits and longest length installations. Pipe diameters are typically 18 inches or larger, lengths can exceed 1,000 feet, and the pullback force is typically in excess of 70,000 pounds. The drill string is usually remote tracked provided from sensors near the leading end of the drill string.

C. *Mini HDD:* Typically used for the smaller diameter pipelines/conduits and for shorter distances. Pipe diameters are typically 6 inches or smaller, lengths are less than 600 feet, and pullback forces are up to 20,000 pounds. The drill string is typically tracked with a surface held walkover transmitter/receiver.

D. *Midi HDD:* Typically used for intermediate sizes and lengths of pipelines/ conduits. Pipelines are typically between 6 inches and 18 inches diameter, lengths are up to 1,000 feet, and pullback forces from 20,000 to 70,000 pounds. Midi HDD equipment may employ similar capabilities to the Maxi HDD rigs but have more limitations on capacity. The drill string is typically tracked with a surface held walkover transmitter/receiver.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Boring equipment shall be matched to the conditions of the project and shall have a pulling force at least 1.25 the maximum calculated peak-pulling requirement for each installation given the site-specific conditions.

B. Boring equipment shall have a mechanical drilling rig with a controlled directional boring head using either a fluid or mechanical cutting head (or

combination of both), assisted and cooled by an approved drilling fluid of low pressure and volume.

C. Approved boring equipment shall be that manufactured by American Augers, Case Construction, Charles Machine Works (Ditch Witch), Straight Line, Tulsa Rig Iron, Vermeer, or approved equal.

D. The location/tracking system employed for determining the location of the drilling head during the pilot bore shall include but not be limited to the position of the boring head, the roll angle, the tilt angle, depth below grade, temperature of data transmitter, and remaining battery life.

E. The Contractor shall select the appropriate drill equipment, which at least meets the minimum requirements established in this specification, to be used for this project.

F. The drill equipment including rod shall be inspected and approved for use by the Contractor before arrival at the work site.

2.02 DRILLING FLUIDS

A. A high-quality drilling fluid shall be used to ensure hole stability, cuttings transport, bit and electronics cooling, and hole lubrication to reduce drag on the drill pipe and the product pipe. Composition of the fluid must comply with all federal, state, and local environmental regulations.

B. The drilling fluid shall be a bentonite slurry mixed with potable or reclaimed water (of proper pH) to ensure no contamination is introduced into the soil during the drilling, reaming, or pipe installation process. The Contractor is responsible for any required pH adjustments. A polymer-based slurry will be considered only if the Contractor demonstrates that a bentonite slurry will not suitable for this project and the proposed polymer slurry is acceptable to the Florida Department of Environmental Protection. Drilling fluids that are petroleum-based or that contain additives that may contaminate the surrounding soils or groundwater shall not be allowed.

C. The type of proposed drilling fluid with a complete listing of all additives along with Material Safety Data Sheets shall be submitted for approval before work begins.

D. Potable water or reclaimed water will be made available to the Contractor. This water will be metered and invoiced to the Contractor at the current effective rate.

2.03 PRODUCT PIPE

A. The nominal diameter and material type of each product pipe shall be as shown on the Drawings.

B. High-Density Polyethylene (HDPE) pipe shall conform to the requirements of Section 15146, High-Density Polyethylene (HDPE) Pipe. The maximum dimension ratio (i.e., the thinnest allowable wall thickness) for HDPE pipe being installed by direction drill shall be 11 (DR11).

PART 3 EXECUTION

3.01 GENERAL

A. No work or drilling shall commence until the Contractor has submitted the required information and a signed-and-sealed bore plan and received written approval from the Engineer regarding the drill path and related procedures.

B. The Contractor shall locate all utilities, structures, etc., within the construction area before any work begins and before equipment is mobilized.

C. Before drilling operations begin, all erosion control devices and dewatering shall be in-place and functional in accordance with Section 02240, Dewatering, and the Contract Documents.

D. The boring rig shall be sufficiently and adequately anchored for the task.

E. Directional drilling equipment machine safety requirements shall include common grounding system to prevent electrical shock in the event of underground electrical cable strike. The grounding system shall connect all pieces of interconnecting machinery; the drill, mud mixing system, drill power unit, drill rod trailer, operator’s booth, worker grounding mats, and any other interconnected equipment to a common ground. The drill shall be equipped with an "electrical strike" audible and visual warning system that will notify the system operators of an electrical strike.

F. The Contractor shall conform to all requirements of Section 02305, Earthwork for Utilities, including, but not limited to, excavation, protection of persons and property, sheeting and shoring, backfill and compaction, and disposal of excess and waste materials.

G. The Contractor shall be responsible for transporting, containing, and storing any water required for the drilling operations, cleanup, and other needs.

H. All drilling fluid excess shall be contained in entry and/or exit pits and pumped/treated/stored as needed to preclude spills and escape to the surrounding environment. Ensure that entry and exit pits are of sufficient size and volume to contain the expected return of drilling fluids and cuttings.

I. Drilling fluid returns can be collected in the entrance pit, exit pit, or spoils recovery pit. The Contractor shall immediately clean up any drilling fluid spills or overflows from these pits.

J. Disposal of the drilling fluids shall be the responsibility of the Contractor and shall be conducted in compliance with all relative environmental regulations, right-of-way and workspace agreements, and permit requirements.

K. The product pipe shall be installed within the limits indicated on the Drawings.

3.02 DRILL SET-UP AND PITS

A. The Contractor may use the set-up areas identified on the Drawings. If additional areas are required, the Contractor shall be responsible for coordinating the additional areas at no additional cost to the Owner.

B. Drill entrance and exit pits are required. The Contractor shall be responsible for design and construction of the drill entrance and exit pits.

C. The drill entrance and exit pits shall be maintained at minimum size to allow only the minimum amount of drilling fluid storage before transfer to mud recycling or processing system or removal from the site.

D. Drilling mud shall not be allowed to flow freely on the site or around the entrance or exit pits. Erosion and sediment control devices shall be set up around each pit. Mud spilled shall be removed as soon as possible and the ground restored to original condition. Pits shall be shored to OSHA standards and the requirement of Section 02305, Earthwork for Utilities.

3.03 DRILL ENTRANCE AND EXIT ANGLE

A. The entrance and exit angles shall such that the elevation profile maintains adequate cover to reduce risk of frac-out and that ground exit occurs as specified herein. The Contractor shall be responsible for ensuring that entrance and exit angles ensure pullback forces do not over stress the pipe.

B. In no case shall the entry or exit angles of the installed pipeline shall be less than 8 degrees from the horizontal and or more than 18 degrees from the horizontal.

C. In addition to the allowable limits of Paragraph 3.04B, the entry and exit angles shall in accordance with those used in the analyses performed in Article 1.03, Quality Assurance.

3.04 PILOT HOLE

A. A pilot hole shall be drilled for all product pipe installations 6-inch-diameter and larger.

B. The type and size of the pilot string cutting head and the diameter of the drill rod shall be selected by the Contractor for each specific application.

C. The cutting head shall be assisted by and cooled by drilling fluid of low pressure and volume.

D. The pilot hole shall be drilled along the approved path. Pilot hole tolerances are as follows:

1. Vertical tolerance: Provide cover in accordance with the approved profile developed under Article 1.03, Quality Assurance.
2. Horizontal tolerance: 3 feet from the centerline of the product pipe.
3. Curve Radius: No curve will be accepted with a radius less than 1.25 times the manufacturer's recommended minimum bending radius for the product pipe being installed by directional drill. NOTE: There are additional stresses imposed on the product pipe due to pulling it around curves versus bending the product pipe in a trench. The minimum bending radius for a product pipe installed by direction drill is greater than the minimum bending radius for the same product pipe installed in a trench.
4. Entry Point Location: The pilot hole entry point shall be established by the Contractor.
5. Exit Point Location: The exit point location shall be established by the Contractor.
6. The installed pipeline cover requirements as shown on the drawings and as specified herein shall not be violated.

E. If significant differing soils or strata from those provided in the geotechnical data and reports are encountered during the pilot boring, the Contractor shall be responsible for changing the drill head and slurry and other means as may be appropriate to complete the bore.

F. The Contractor shall adjust the viscosity of the drilling fluid to match the conditions of the project. The Owner shall bear no responsibility for loss of drilling fluid or loss of drilling equipment if an obstacle or unknown condition is encountered during the work.

G. The Owner shall not be responsible for underground obstacles (such as boulders, tree stumps, loose and unconsolidated soils, hard rock, or utilities) or structures that may be encountered during the work.

H. If hydraulic fracture occurs, the Contractor shall implement the approved frac-out contingency plan and repair all related damages, cleanup of fluids, and make corrections to preclude future events. Such corrections may include but not be limited to re-profiling the bore or changing the viscosity of the drilling fluid or plugging the fracture or a combination of these. If the borehole is abandoned and an alternate route is chosen, the abandoned borehole shall be filled with excavatable flowable fill.

I. Where construction activities are close to or under water bodies (lakes, creeks, canals, retention basins) or wetlands, special attention shall be given to the proposed profile to ensure that hydraulic fracture does not occur under the water feature. Additionally, silt fences and similar approved erosion control devices shall be used to protect the water body(s) from the construction activities.

3.05 BACK-REAMING

A. Back-reaming shall be required for all product pipe installation 6-inch-diameter and larger.

B. The type of back-reamer to be utilized shall be determined by the type of subsurface soil conditions that are encountered during the pilot hole drilling operation. The back-reamer type shall be selected by the Contractor for each specific application.

C. Back-reaming shall be conducted in single or multiple passes of the borehole and shall enlarge the borehole to at least 1.4 times the outer diameter of the product pipe to be installed. Larger reaming may be required depending on subsurface conditions encountered. The number of back-reaming passes and the borehole size, provided the minimum requirements are met, shall be the Contractor’s discretion.

3.06 PULL BACK

A. Unless approved otherwise, the entire product pipeline to be installed via directional drill shall be fully assembled before commencement of pull back operations.

B. The product pipeline shall be supported during pullback operations in a manner to enable it to move freely and prevent damage. Properly spaced rollers and at

proper heights shall be used to transition the product pipe from the horizontal to oblique positions for insertion into the borehole.

C. Unless approved otherwise, the product pipeline shall be installed in one continuous pull.

D. The product pipe shall be installed with a continuous #10-gauge tracer wire of sufficient type to remain intact and usable upon completion of the installed product pipe.

E. Torsional stress shall be minimized by using a swivel to connect the pull section to the reaming assembly.

F. Maximum allowable tensile force imposed on the pull section shall not exceed 80% of the pipe manufacturer's safe pull (or tensile) strength. If the pull section is made up of multiple pipe size or materials, the lowest safe pull strength value shall govern and the maximum allowable tensile force shall not exceed 80% of this value.

G. External pressure shall be minimized during installation of the pullback section in the reamed hole. Damaged pipe resulting from external pressure shall be replaced at no cost to the Owner. Buoyancy modification shall be at the discretion of the Contractor.

H. The Contractor shall take precautions to protect the product pipeline from damage and marring during the installation and pullback operation. Such precautions shall include but not be limited to using rollers, pulleys, idlers, and trunnions.

I. After pullback is completed, the Contractor shall “rest” the product pipeline to allow for any contraction and shrinkage for at least 24 hours. No additional work on the pulled product pipeline shall be allowed during the resting period.

3.07 GUIDANCE SYSTEMS

A. Walkover guidance systems are acceptable for this project. A magnetic survey tool located behind the pilot string cutting head shall also be used for this project.

3.08 DOCUMENTATION

A. The Contractor shall maintain drilling logs that accurately provide drill bit location (both horizontally and vertically) at least every 15 feet along the drill path. In addition, logs shall be kept that record, as a minimum, the following

every 15 minutes throughout each drill pass, back-reaming pass, or product pipe installation pass:

1. Drilling fluid pressure.
2. Drilling fluid flow rate.
3. Drilling fluid temperature.
4. Drill thrust force.
5. Drill pullback force.
6. Drill head torque.

B. Each day, the Contractor shall also record the total amount of drilling mud used and viscosity of the drilling mud. If the viscosity of the drilling mud is changed, the Contractor shall record the new viscosity and the time the mud viscosity was changed.

C. Samples of each log sheet shall be submitted to the Owner/Engineer for approval before work begins.

D. The Engineer shall have access to instrumentation, readings, and logs at all times during operation.

E. After the pull is completed, the Contractor shall provide Record Drawing information of the installed product pipeline. The Record Drawing information shall provide the horizontal and vertical location of the product pipeline tied to the project control datum. At a minimum, the entry and exit locations, angles, and elevations shall be recorded and the locations and depths of the product pipeline shall be recorded at intervals along the entire length of the profile. For profiles under non-submerged surfaces, the interval shall be 10 feet. For profiles under submerged surfaces (such as a lake, stream, canal, or river), the interval shall be 20-foot. This information shall be provided to the Owner/Engineer within 7 calendar days after the completion of each bore path.

3.09 MAINTENANCE OF TRAFFIC

A. During assembly and pullback of the pipe, the pipe must be laid out in such a way to minimize disrupting and interfering with vehicular and pedestrian traffic or other operational conflicts that the Owner/Engineer identify.

B. The Contractor shall be responsible for safe maintenance of pedestrian and vehicular of traffic. If the construction activities require such action a maintenance-of-traffic plan shall be submitted to the Owner/Engineer for approval before work begins. The plan shall be in accordance with Florida Department of Transportation Standard Index 600 Series and Technical Specifications.

3.10 UTILITY LOCATES

A. The Contractor shall locate all utilities before start of excavation or drilling. The Contractor shall be responsible for damage to utilities and shall repair damaged utilities at no cost to the Owner.

3.11 CLEANUP

A. Immediately upon completion of work of this Section, all rubbish and debris shall be removed from the job site. All construction equipment and implements of service shall be removed and the entire area involved shall be left in a neat condition acceptable to the Engineer.

B. "Blow holes" or "breakouts" of drilling fluid to the surface shall be cleaned up immediately and the surface area returned to its original condition. All drilling fluids, spoils, and separated materials shall be disposed of in compliance with federal, state, and local environmental regulations.

C. After the product pipe installation is completed, the Contractor shall restore the pits and drill rig anchors and work areas to their pre-construction or better condition. Seeding shall not be allowed in lieu of sod unless granted in writing by the Owner/Engineer.

END OF SECTION

SECTION 02920
SEEDING AND SODDING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall provide all materials, equipment, labor, and work to construct the project in accordance with the Contract Documents. No time extensions shall be given to the Contractor for not establishing a grass or sod cover during the "proper" planting season.

B. This work includes but is not limited to the following items specified in this Section:

1. Placing sod to provide grass as finished ground cover at all unpaved disturbed areas of the site, including the entire areas of the ponds shall be as indicated on the Contract Drawings.
2. Placing seed to provide grass as finished ground cover in areas (not designated to be sodded) that were disturbed by the work. Provide seed and topsoil for all areas not designated to be sodded that have been disturbed or are indicated on the Contract Drawings to be seeded.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction, latest edition:

1. FDOT Section 570 Performance Turf.
2. FDOT Section 981 Turf Materials.
3. FDOT Section 982 Fertilizer.
4. FDOT Section 983 Water for Grassing.
5. FDOT Section 987 Soil Layer Materials.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. Deliver, store, protect, and handle products to the site to prevent damage from wetness and weather conditions.

C. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

D. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of the manufacturer.

1.06 MAINTENANCE

A. Maintenance shall be as indicated under Part 3, Execution, of this Section.

1.07 DEFINITIONS

A. Weeds: Weeds include but are not limited to Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragqwort, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

1.08 REGULATORY REQUIREMENTS

A. The Contractor shall comply with regulatory agencies for fertilizer and herbicide composition.

PART 2 PRODUCTS

2.01 GENERAL (NOT USED)

2.02 MATERIALS

A. Topsoil

1. Top soil shall be supplied and installed in accordance with FDOT Standard Section 987.

B. Fertilizer

1. Fertilizer shall be a complete, commercial-grade mixture of 12-8-8 analysis.
2. Fertilizer shall conform to applicable state laws for the material used.
3. Commercial-grade mixture shall conform to FDOT Standards, Section 982.

C. Mulch

1. Mulch shall conform to FDOT Standards, Section 981.
2. Mulch shall be dry grain straw or hay, free of noxious weeds.
3. Mulch shall be thoroughly cured and dried before use.
4. Forest litter, pine needles, or Spanish Moss will not be acceptable.

D. Seed

1. All grass seed shall be the product of a reputable supplier and shall conform to the requirements of the State Department of Agriculture and Consumer Services and all applicable state laws.
2. Grass seed shall conform to FDOT Standards Section 981, with a minimum 80% purity and 80% germination with no noxious weeds.
3. Seed shall be Argentine Bahia applied at a minimum rate of 10 pounds per 1,000 square feet. A thick stand of grass shall be provided.

E. Sod

1. Sod shall conform to FDOT Standards Section 981. A thick stand of grass shall be provided at all locations.
2. Sod shall be Argentine Bahia.
3. Sod planted on private properties shall match the existing sod when practical.

F. Water

1. The water used to produce grass may be obtained from any approved source, in accordance with FDOT Section 983. The water shall be free of excess and harmful chemicals, acids, alkalies, and all substances which may be harmful to plant growth or obnoxious to traffic. Salt or brackish water shall not be used. The Contractor shall make arrangements to secure and pay for water. The Contractor shall make all provisions necessary to water until a thick stand of grass is established.

PART 3 EXECUTION

3.01 SURFACE PREPARATION

A. The entire area to be seeded, as shown on the Drawings or required in this Section, shall be covered with a 6-inch layer of muck or suitable topsoil, carefully spread and disked lightly into the existing soil and finished to the grades indicated.

3.02 FERTILIZING

A. Fertilizer shall be applied uniformly on the surface of the ground at a minimum rate as specified in Section 570 of FDOT Specifications. It shall be mixed into the soil with a disk harrow, where practicable, or by hand-raking in areas of limited accessibility. Mixing shall be continued until the fertilizer is uniformly incorporated into the top 3 inches of soil.

3.03 MULCHING

A. After spreading and mixing the fertilizer, the Contractor shall apply approximately 2 inches, loose thickness, of the mulch material uniformly over the grassing area and cut into the soil to produce a loose mulch thickness of 3 to 4 inches, in accordance with Section 570 of FDOT Specifications. Care shall be exercised to prevent the mulch from being cut too deeply into the soil.

3.04 SEEDING

A. Seed which has become wet or moldy shall not be used. Soon after the mulch material has been cut into the soil and while the soil is still loose and moist, the seed shall be scattered uniformly over the grassing area. Application shall be in conformance with FDOT Standards, Section 570.

3.05 SODDING

A. Application shall be in accordance with FDOT Standards, Section 575.

3.06 WEED CONTROL

A. The Contractor shall apply herbicides as required and as recommended by the County Agricultural Agent. Herbicides shall only be applied as needed.

3.07 COMPACTION

A. Immediately after the seeding is complete, the entire grassed or mulched area shall be compacted with a light roller. Rolling shall be continued until the area is firmly but not tightly packed.

3.08 EQUIPMENT

A. All equipment used in the operation of grassing shall be adequate to produce the required results. Equipment for placing mulch material into the soil shall be suitable for cutting the specified materials uniformly into the soil and to the required controlled depth. Rollers shall have corrugated or notched surfaces and shall be at least 12 inches in diameter. Smooth surface rollers will not be permitted.

3.09 GROUND COVER DATA

A. Planting dates, types of seeds, seed mixtures, and rates of application shall be as set forth in this Section. No changes may be made in the ground cover type without the approval of the Engineer.

3.10 GROUND COVER ESTABLISHMENT

A. General Requirements

1. The Contractor shall provide ground cover (sod and seed) establishment of the specified permanent vegetation before final acceptance of the project with no dead areas of ground cover. Groundcover (sod and seed) establishment shall consist of necessary preserving and protecting to keep the grassed areas in a satisfactory condition. The Contractor shall water the grassed areas as long and as often as necessary to promote maximum practicable growth. At any time, the Engineer may require replanting an area or portion of an area which, for any cause, shows unsatisfactory growth. Except as otherwise specified or permitted by the Engineer, the Contractor shall prepare areas to be replanted in accordance with the

requirements of the Specifications as if such replanting were the initial planting. However, the type of fertilizer and the applicable rate of fertilizer to be furnished and applied by the Contractor as part of plant establishment occasioned by replanting shall be determined by soil tests or otherwise established.

B. Growth and Coverage

1. The Contractor shall be responsible for providing satisfactory growth and coverage as defined below. Growth and coverage shall be considered acceptable when all areas show a satisfactory visible growth with no bare spots larger than 1 square foot. Bare spots shall be scattered, and the total bare areas should not comprise more than 1/100 of any given area.

3.11 EXTENT OF SOD/GRASS MAINTENANCE

A. The Contractor is responsible for all sod and grass maintenance until the date of final completion of the project. Sod and grass maintenance include cutting, watering, fertilizing, re-seeding, and re-sodding as required to maintain the required coverage of healthy, vibrant grass and sod cover.

END OF SECTION

DIVISION 3

CONCRETE

SECTION 03301
CONCRETE AND REINFORCING STEEL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and incidentals required to perform all concrete work as ordered by the Engineer, as shown on the Drawings, and as specified in this Section.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance. Reproductions of contract drawing are unacceptable. Submit full fabrication drawings and technical data on all materials and components. Submit other data specified in this Section when required. Submittals shall include at least the followings:

A. Shop Drawings and Technical Data

1. Joints and joint accessories.
2. Reinforcing steel including bar schedules and bending details.
3. Concrete mix for each formulation of concrete proposed for use, including constituent quantities per cubic yard, water cementitious ratio, type, and manufacturer of cement.
4. Formwork and accessories.
5. Grout.
6. Each type of mechanical reinforcing steel connector.

B. Samples

1. Two samples of each type of mechanical reinforcing steel connection.

C. Test Reports

1. Sieve analysis of fine and coarse aggregates.

2. Concrete mix for each formulation of concrete proposed for use, including constituent quantities per cubic yard, water cementitious ratio, type and manufacturer of cement, and either a. or b. below:

a. Standard deviation data for each proposed concrete mix based on statistical records.

b. Water cementitious ratio curve for each proposed concrete mix based on laboratory tests. Give average cylinder strength test results at 28 days for laboratory concrete mix designs. Provide results of 7- and 14-day tests if available.

3. Concrete compressive strength, air content, and slump tests.

D. Certifications

1. Certify that admixtures used in the same concrete mix are compatible with each other and the aggregates.
2. Material Safety Data Sheet (MSDS).
3. Curing concrete elements.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Concrete Institute (ACI)

1. ACI 117—Specification for Tolerances for Concrete Construction and Materials and Commentary.
2. ACI 211.1—Standard Practice for Selecting proportions for Normal, Heavyweight, and Mass Concrete.
3. ACI 301—Specifications for Structural Concrete.
4. ACI 305R—Guide to Hot Weather Concreting.
5. ACI 306R—Guide to Cold Weather Concreting.
6. ACI 306.1—Standard Specification for Cold Weather Concreting.
7. ACI 315—Details and Detailing of Concrete Reinforcement.
8. ACI 318—Building Code Requirements for Structural Concrete and Commentary.
9. ACI 347R—Guide to Formwork for Concrete.
10. ACI 350R—Environmental Engineering Concrete Structures.
11. ACI MCP-4—Manual of Concrete Practice – Volume 4.

B. American Society for Testing and Materials (ASTM)

1. ASTM A615/A615M—Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
2. ASTM A1064/A1064M—Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

3. ASTM C31/C31M—Standard Practice for Making and Curing Concrete Test Specimens in the Field.
4. ASTM C33/C33M—Standard Specification for Concrete Aggregates.
5. ASTM C94/C94M—Standard Specification for Ready-Mixed Concrete.
6. ASTM C143/C143M—Standard Test Method for Slump of Hydraulic-Cement Concrete.
7. ASTM C150/C150M—Standard Specification for Portland Cement.
8. ASTM C171—Standard Specification for Sheet Materials for Curing Concrete.
9. ASTM C173/C174M—Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
10. ASTM C231/C231M—Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
11. ASTM C260/C260M—Standard Specification for Air-Entraining Admixtures for Concrete.
12. ASTM C309—Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
13. ASTM C494/C494M—Standard Specification for Chemical Admixtures for Concrete.
14. ASTM C618—Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
15. ASTM C827/C827M—Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures.
16. ASTM C881/C881M—Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
17. ASTM C920—Standard Specification for Elastomeric Joint Sealants.
18. ASTM C932—Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering.
19. ASTM C990—Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants.
20. ASTM C1107/C1107M—Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
21. ASTM C1116/C1116M—Standard Specification for Fiber-Reinforced Concrete.
22. ASTM D1751—Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
23. ASTM D1752—Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.
24. ASTM D2103—Standard Specification for Polyethylene Film and Sheeting.

25. ASTM D4397—Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications.
26. ASTM D6690—Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

C. Concrete Reinforcing Steel Institute (CRSI)

1. MSP—Manual of Standard Practice.

1.04 QUALITY ASSURANCE

A. Reinforced concrete shall comply with ACI 318; the recommendations of ACI 350R; and other stated requirements, codes, and standards. The most stringent requirement of the codes, standards, and this Section shall apply when conflicts exist.

B. Only one source of cement and aggregates shall be used on any one structure. Concrete shall be uniform in color and appearance.

C. Thirty days in advance of placing concrete, the Contractor shall discuss with the Engineer the sources of individual materials and batched concrete proposed for use. Discuss placement methods, waterstops, and curing. Propose methods of hot and cold weather concreting as required. Before placing any concrete containing a high-range water-reducing admixture (plasticizer), the Contractor, accompanied by the plasticizer manufacturer, shall discuss with the Engineer the properties and techniques of batching and placing plasticized concrete.

D. A firm providing field testing and inspection services will be approved by the Owner. The cost of such work, except as specifically stated otherwise, shall be paid by the Contractor and reimbursed by the Owner under the Concrete Testing Allowance. The following items shall be tested by the Owner to verify conformity with this Section:

1. Concrete placements—compressive strength (cylinders), compressive strength (cores), slump, and air content.
2. Other materials or products that may come under question.
3. All materials incorporated in the work shall conform to accepted samples.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

B. Furnish the Owner with a written warranty that the mechanical splice system is free from manufacturing defects and will perform as represented.

PART 2 PRODUCTS

2.01 GENERAL

A. The use of the manufacturer's name and model or catalog number is to establish the standard of quality and general configuration desired.

B. Like items of materials shall be the end products of one manufacturer to provide standardization of appearance, maintenance, and manufacturer's service.

C. Materials shall comply with this Section and any applicable State or local requirements.

2.02 MATERIALS

A. Cement: Domestic Portland cement complying with ASTM C150/C150M. Air entraining cements shall not be used. The brand of cement shall be subject to approval by the Engineer and one brand shall be used throughout the Work. The following cement type(s) shall be used:

1. Class A, B, C, D Concrete Type II with the addition of fly ash resulting in C3A being below 5% of total cementitious content, Type III limited to 5% C3A, or Type V.

B. Aggregate: Washed inert natural sand conforming to the requirements of ASTM C33/C33M.

C. Water: Potable water free from injurious amounts of oils, acids, alkalis, salts, organic matter, or other deleterious substances.

D. Admixtures: Admixtures shall be free of chlorides and alkalis (except for those attributable to water). When more than one admixture is required to be used in a concrete mix, the admixtures shall be from the same manufacturer. Admixtures shall be compatible with the concrete mix, including other admixtures, and shall be suitable for use in contact with potable water after 30 days of concrete curing.

1. Air-Entraining Admixture—The admixture shall comply with ASTM C260/C260M.
2. Water-Reducing Agent—The admixture shall comply with ASTM C494/C494M, Type A.

3. High-Range Water-Reducer (Plasticizer)—The admixture shall comply with ASTM C494/C494M, Type F and shall result in non-segregating plasticized concrete with little bleeding and with the physical properties of low water/cement ratio concrete. The treated concrete shall be capable of maintaining its plastic state more than 2 hours.
4. Admixtures causing retarded or accelerated setting of concrete shall not be used without written approval from the Engineer. When allowed, the admixtures shall be retarding or accelerating water-reducing or high-range water-reducing admixtures.

E. Pozzolan (Fly Ash) shall be Class F fly ash complying with ASTM C618, except that the Loss on Ignition (LOI) shall be limited to 3% maximum.

F. Materials for Curing Concrete

1. Sheet Curing Materials—Waterproof paper, polyethylene film, or white burlap polyethylene sheeting shall comply with ASTM C171.
2. Liquid Curing Compound—Liquid membrane forming curing compound shall comply with the requirements of ASTM C309, Type 1 D (clear or translucent with fugitive dye) and shall contain no wax, paraffin, or oil. The curing compound shall be approved for use in contact with potable water after 30 days according to NSF 61 (non-toxic and free of taste or odor).

G. Chemical hardener shall be Lapidolith by Sonneborn, Hornolith by A.C. Horn, Penalith by W.R. Meadows, or equal fluosilicate base material.

H. Concrete sealer shall be "Kure N Seal," by Sonneborn, Minneapolis, MN, or equal.

2.03 MIXES

A. Select proportions of ingredients to meet the design strength and materials limits specified in Table 1 and to produce concrete having proper workability, durability, strength, appearance, and other required properties. Proportion ingredients to produce a homogenous mixture, which will readily work into corners and angles of forms and around reinforcement without permitting materials to segregate or allowing excessive free water to collect on the surface.

B. The design mix shall be based on standard deviation data of prior mixes with essentially the same proportions of the same constituents or, if such data are not available, be developed by a testing laboratory acceptable to the Engineer and engaged by and at the expense of the Contractor. Mixes based on standard deviation shall be accepted based on the modification factors for standard

deviation tests contained in ACI 318. The water content of the concrete mix, determined by laboratory testing, shall be based on a curve showing the relation between water cementitious ratio and 7- and 28-day compressive strengths of concrete made using the proposed materials. The curves shall be determined by four or more points, each representing an average value of at least three test specimens at each age. The curves shall have a range of values sufficient to yield the desired data, including the specified design strengths as modified below, without extrapolation. The water content of the concrete mixes to be used, as determined from the curve, shall correspond to strengths 16% greater than the specified design strengths. The resulting mix shall not conflict with the limiting values for maximum water cementitious ratio and net minimum cementitious content as specified in Table 1.

C. Entrained air, as measured by ASTM C231/C231M, shall be as shown in Table 1.

1. If the air-entraining agent proposed for use in the mix requires testing methods other than those in ASTM C231/C231M to accurately determine air content, make special note of this requirement in the admixture submittal.

D. Slump of the concrete as measured by ASTM C143/C143M shall be as shown in Table 1. If a high-range water-reducer (plasticizer) is used, the slump indicated shall be that measured before plasticizer is added. Plasticized concrete shall have a slump ranging from 7 to 10 inches.

TABLE 1
CONCRETE MIX REQUIREMENTS

Class	Design Strength (1)	Cement (2)	Fine Aggregate (2)	Coarse Aggregate (3)	Cementitious Content (4)
A	2500	C150 Type II	C33	57	440 min.
B	3000	C150 Type II	C33	57	480 min.
C	4000	C150 Type II	C33	57	560 min.
D	5000	C150 Type II	C33	57	600 min.

Class	W/C Ratio (5)	Fly Ash	AE Range (6)	WR (7)	HRWR (8)	Slump Range (Inches)
A	0.60 max.	--	3.5 to 5	Yes	*	1-4
B	0.54 max.	--	2.5 to 5	Yes	*	1-3
C	0.44 max.	20 – 25%	2.5 to 5	Yes	*	3-5
D	0.40 max.	--	3.5 to 5	Yes	*	3-5

NOTES:
(1) Minimum compressive strength in psi at 28 days.
(2) ASTM designation.
(3) Size Number in ASTM C33/C33M.
(4) Cementitious content in pounds/cubic yard.
(5) W/C is Water-Cementitious ratio by weight.
(6) AE is percent air-entrainment.
(7) WR is water-reducer admixture.
(8) HRWR is high-range water-reducer admixture.
* HRWR used at the Contractor's option.

2.04 CONCRETE REINFORCEMENT

A. Reinforcing steel shall be deformed bars and shall comply with ASTM A615/A615M, Grade 60.

B. Welded wire fabric shall be flat sheet and comply with ASTM A1064/A1064M.

C. Fiber reinforcement shall be synthetic fibers with 100% polypropylene collated, fibrillated fibers and with a minimum tensile strength of 70 ksi. Fiber-reinforced concrete shall be in accordance with ASTM C1116/C1116M, Type III, Synthetic Fiber-Reinforced Concrete. Use a minimum of 1.5 pounds of fibers per cubic yard of concrete. Add fibers at the batch plant.

2.05 FORMS

A. Forms for cast-in-place concrete shall be made of wood, metal, or other approved material. All forms shall be designed and constructed to provide a flat, uniform concrete surface requiring minimal finish or repairs.

B. Forms shall be free from roughness and imperfections, substantially watertight, and adequately braced and tied to prevent motion when concrete is placed. No wooden spreaders will be allowed in the concrete.

C. The form-release agent shall be coated on all surfaces in contact with concrete using effective, non-staining, non-residual, water-based, bond-breaking form coatings.

D. Wire ties will not be allowed. Metal ties or anchorages necessary within the forms shall be so constructed that the metal work can be removed for a depth of at least

1 inch from the surface of the concrete without injury to such surface by spalling or otherwise. Forms shall be thoroughly cleaned before using and shall be treated with oil or other approved material.

E. All exposed edges of the finished concrete shall be chamfered 3/4 inch.

2.06 EXPANSION/CONTRACTION JOINTS

A. Pre-molded joint fillers for water holding structures shall be non-extruding and resilient non-bituminous type and comply with ASTM D1752, Type III. Joint fillers for sidewalk and roadway pavements shall be asphalt-impregnated fiber board conforming to ASTM D1751.

B. Joint sealants shall comply with ASTM D6690, Type M class 25 for horizontal surface, and ASTM C920, Type M grade NS class 25 for vertical surface greater than 3% slope.

C. Bond breaker shall be an adhesive-backed glazed butyl or polyethylene tape.

2.07 WATERSTOPS (NOT USED)

2.08 BONDING MATERIALS

A. The concrete bonding agent shall be an aqueous-phase, film-forming, non-oxidizing, freeze- and thaw-resistant compound agent suitable for brush or spray application conforming to ASTM C932.

B. Epoxy adhesive binder shall be two-component, epoxy-polysulfide polymer-type bind with amine-type curing agent conforming to ASTM C881/C881M, Type II.

2.09 VAPOR BARRIER

A. Vapor barrier shall be clear polyethylene sheeting, 6-mil conforming to ASTM D2103 or D4397.

2.10 GROUT

A. Non-shrink, cementitious grout shall comply with ASTM C1107/C1107M, Grade B or C.

B. Non-shrink, epoxy machinery grout shall conform to ASTM C827/C827M with compressive strength of 12,000 psi in 7 days.

C. Concrete grout shall have a compressive average strength of 3,000 psi at 29 days. Synthetic fiber reinforcing fibers shall be added to the grout mix at rate of 1.5 pounds of fiber per cubic yard of grout.

PART 3 EXECUTION

3.01 REINFORCING STEEL

A. Reinforcement shall be accurately fabricated to the dimensions shown. Bars shall be bent around a pin having a diameter not less than that recommended in ACI 318. All bars shall be bent cold.

B. Reinforcement shall be shipped to the work with bars of the same size and shape fastened in bundles with metal identification tags giving size and mark securely wired on. The identification tags shall be labeled with the same designation as shown on submitted bar schedules and shop drawings.

C. All bars shall be stored off the ground and shall be protected from moisture and be kept free from dirt, oil, or injurious coatings. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

D. Tension lap splices shall be provided at all laps in compliance with ACI 318. All bar splices shall be staggered wherever possible. When splicing bars of different diameters, the length of lap is based on the larger bar. Class B splices shall be used at all locations unless otherwise indicated on the Drawings.

E. Before being placed in position, reinforcement shall be thoroughly cleaned of loose mill and rust scale, dirt, and other coatings that reduce or destroy bond. Where there is delay in depositing concrete after reinforcement is in place, bars shall be reinspected and cleaned when necessary.

F. Reinforcement that is to be exposed for a considerable length of time after being placed shall be painted with a heavy coat of cement grout, if required.

G. In no case shall any reinforcing steel be covered with concrete until the number and position of the reinforcements have been checked by the Engineer and his/her permission given to proceed with the concreting.

3.02 MECHANICAL COUPLER SYSTEM

A. Use mechanical reinforcing steel coupling system only where indicated. Install in accordance with the manufacturer's written instructions and as specified in this Section.

B. Upon receiving the coupler system, obtain the threaded length for the male ends and sample each lot for variation in thread length on male ends. Record the amount of actual thread (per lot).

C. After formwork is removed, confirm cap is in position (female end).

D. Before installing the male end, remove screwed cap and confirm that the female end (coupler) is clean and free of concrete splatter, dirt, burrs, or other matter which may foul threads.

E. Tighten the dowel bar male end until the threads are fully engaged and no threads are exposed. Do not strip threads.

F. Visually inspect all splice locations. A correctly installed splice will show no exposed threads on the threaded splice bars.

3.03 CONCRETE MIXING AND TRANSPORTING

A. Concrete shall be ready-mixed concrete produced by equipment acceptable to the Engineer. No hand mixing will be permitted. Clean each transit mix truck drum and reverse drum rotation before the truck proceeds under the batching plant. Equip each transit mix truck with a continuous, nonreversible, revolution counter showing the number of revolutions at mixing speeds.

B. Ready mix concrete shall be transported to the site in watertight agitator or mixer trucks loaded not in excess of their rated capacities as stated on the name plate.

C. Keep the water tank valve on each transit truck locked at all times. Any addition of water must be directed by the Engineer. Added water shall be incorporated by additional mixing of at least 35 revolutions. All added water shall be metered and the amount of water added shall be shown on each delivery ticket.

D. All central plant and rolling stock equipment and methods shall comply with ACI 318 and ASTM C94/C94M.

E. Select equipment of size and design to ensure continuous flow of concrete at the delivery end. Metal or metal-lined non-aluminum discharge chutes shall be used and shall have slopes not more than 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 feet long and chutes not meeting slope requirements may be used if concrete is discharged into a hopper before distribution.

F. Re-tempering (mixing with or without additional cement, aggregate, or water) of concrete or mortar which has reached initial set will not be permitted.

G. Handle concrete from mixer to placement as quickly as practicable while providing concrete of required quality in the placement area. Dispatch trucks from the batching plant so they arrive at the work site just before the concrete is required, thus avoiding excessive mixing of concrete while waiting or delays in placing successive layers of concrete in the forms.

H. Furnish a delivery ticket for ready-mixed concrete to the Engineer as each truck arrives. Each ticket shall provide a printed record of the weight of cement and each aggregate as batched individually. Use the type of indicator that returns for zero punch or returns to zero after a batch is discharged. Clearly indicate the weight of fine and coarse aggregate, cement, and water in each batch; the quantity delivered; the time any water is added; and the numerical sequence of the delivery. Show the time of day batched and time of discharge from the truck. Indicate the number of revolutions of the truck mixer.

I. Temperature and Mixing Time Control

1. In cold weather, do not allow the as-mixed temperature of the concrete and concrete temperatures at the time of placement in the forms to drop below 40°F.

2. If the water or aggregate has been heated, combine the water with aggregate in the mixer before cement is added. Do not add cement to mixtures of water and aggregate when the temperature of the mixture is greater than 90°F.

3. In hot weather, cool ingredients before mixing to maintain temperature of the concrete below the maximum placing temperature of 90°F. If necessary, substitute well-crushed ice for all or part of the mixing water.

4. The maximum time interval between adding mixing water and/or cement to the batch and placing concrete in the forms shall not exceed the values shown in Table 2.

TABLE 2
MAXIMUM TIME TO DISCHARGE OF CONCRETE

Air or Concrete Temperature (whichever is higher)	Maximum Time
80 to 90°F (27 to 32°C)	45 minutes
70 to 79°F (21 to 26°C)	60 minutes
40 to 69°F (5 to 20°C)	90 minutes

J. If an approved high-range water-reducer (plasticizer) is used to produce plasticized concrete, the maximum time interval shall not exceed 90 minutes.

3.04 CONCRETE APPEARANCE

A. Concrete mix showing either poor cohesion or poor coating of the coarse aggregate with paste shall be remixed. If this does not correct the condition, the concrete shall be rejected.

B. Concrete for the work shall provide a homogeneous structure which, when hardened, will have the required strength, durability, and appearance. Mixtures and workmanship shall be such that concrete surfaces, when exposed, will require no finishing. When concrete surfaces are stripped, the concrete when viewed in good lighting from 10 feet away shall be pleasing in appearance and at 20 feet shall show no visible defects.

3.05 PLACING CONCRETE

A. Reinforcement, where required, shall be accurately placed in the exact positions shown, shall be secured against displacement with annealed iron wire ties or suitable clips at intersections, and shall have a clear space of 2 inches between the steel and face of forms unless otherwise indicated. Wire ties passing through the forms to hold the steel in proper position will not be allowed. Concrete blocks with wire ties cast in them may be used where approved by the Engineer to maintain the clearance between reinforcement and forms. Reinforcing bars shall be free from rust, scale, dirt, grease, and injurious contaminants.

B. No concrete shall be placed until the Engineer has approved forms and method of placement. Before concrete is deposited, all debris, foreign matter, dirt, and water shall be removed from the forms. The surface of concrete previously placed, such as manhole bases or horizontal construction joints, shall be cleaned and brushed with cement paste. Concrete shall not be placed in water or submerged within 24 hours after placing, nor shall running water be permitted to flow over the surface of fresh concrete within 4 days after its placing.

C. Deposit concrete as near its final position as possible to avoid segregation due to rehandling or flowing. Pumping of concrete will be permitted when an approved design mix and aggregate sizes, suitable for pumping, are used. Do not deposit concrete that has partially hardened or has been contaminated by foreign materials. If the section cannot be placed continuously, place construction joints as specified or as approved. Place concrete for walls using tremie tubes in 12- to 24-inch lifts, keeping the surface horizontal. Do not drop concrete more than 4 feet.

D. High-frequency mechanical vibrators shall be used to the extent necessary to obtain proper consolidation of the concrete. Care shall be taken to avoid segregating aggregates by excessive vibration. Concrete adjacent to forms and around pipe stubs shall be carefully spaded or rodded.

E. Concrete walls shall be deposited in one continuous operation with concrete brought up evenly on all sides. Chutes shall be of metal, "U" shaped, and provided with a baffle plate at the end, if necessary, to prevent segregation of materials. Chutes shall be placed at an angle of not less than 25 degrees, nor more than 45 degrees from horizontal and they shall be kept clean and free from hardened concrete.

F. No concrete shall be mixed or placed during freezing weather without explicit permission. When placing concrete when the air temperature is below 40ºF, heat the water, sand, and gravel so that the temperature of the concrete will be at least 50ºF. This temperature shall be maintained for 72 hours after placing.

3.06 FIELD TESTS

A. The Engineer will take sets of three field control cylinder specimens during the progress of the work, in compliance with ASTM C31/C31M. The number of sets of concrete test cylinders taken of each class of concrete placed each day shall not be fewer than one set nor fewer than one set for each 150 cubic yards of concrete nor fewer than one set for each 5,000 square feet of surface area for slabs or walls. One cylinder shall be broken at 7 days and two cylinders shall be broken and their strengths averaged at 28 days. When the average 28-day compressive strength of the cylinders in any set falls below the specified compressive strength or below proportional minimum 7-day strengths (where the proper relation between 7- and 28-day strengths has been established by tests), the Engineer may reject the concrete represented by the set of cylinders and may require modification of the concrete and/or require modification of the proportions, water content, or temperature conditions of the design mix to achieve the required strengths.

B. The Contractor shall cooperate in testing by allowing free access to the work for selecting samples, providing an insulated closed curing box for specimens, protecting the specimens against injury or loss through his/her operations, and furnishing material and labor required for taking concrete cylinder samples. All shipping of specimens will be paid for by the Owner.

C. Slump tests will be made in the field by the Engineer in conformity with ASTM C143/C143M.

D. Tests for air content shall be made in compliance with either the pressure method complying with ASTM C231/C231M or by the volumetric method complying with ASTM C173/C173M.

3.07 FORMED SURFACES

A. Forms shall remain in-place for the time specified in ACI MCP-4. Do not remove forms and shores until the concrete has gained sufficient strength to support its weight and superimposed loads.

B. Exercise care to prevent damaging edges or obliterating the lines of chamfers, rustications, or corners when removing the forms or performing any other work adjacent to such chamfers, rustications, or corners.

C. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete.

D. Rough Form Finish

1. Immediately after stripping forms and before the concrete has changed color, carefully remove all fins and projections.
2. Promptly fill holes left by tie cones and defects as specified.

3.08 FLOORS AND SLABS

A. Floated Finish

1. Machine Floating:

a. Screed slabs with straightedges to the established grades shown on the Drawings. Immediately after final screeding sprinkle a dry cement/sand shake in the proportion of two sacks of Portland cement to 350 pounds of coarse natural concrete sand evenly over the surface at the rate of approximately 500 pounds/1,000 square foot of slab. Do not sprinkle neat, dry cement on the surface.

b. The application of the cement/sand shake may be eliminated at the discretion of the Engineer if the base slab concrete exhibits adequate fattiness and homogeneity and the need is not indicated. When the concrete has hardened sufficiently to support the weight of a power float without the float's digging into or disrupting the level surface, thoroughly float the shake into the surface with a heavy revolving disc-type power compacting machine capable of providing a 200-pound compaction force distributed over a 24-inch-diameter disc.

c. Start floating along walls and around columns and then move systematically across the surface leaving a matte finish.

d. The compacting machine shall be the "Kelly Power Float with Compaction Control" as manufactured by Kelley Industries of SSP Construction Equipment Inc., Pomona, CA or equal. Troweling machines equipped with float (shoe) blades that are slipped over the trowel blades may be used for floating. Floating with a troweling machine equipped with normal trowel blades will not be permitted. The use of any floating or troweling machine which has a water attachment for wetting the concrete surface during finishing will not be permitted.

2. Hand Floating:

a. In lieu of power floating, small areas may be compacted by hand floating. The dry cement/sand shake previously specified shall be used unless specifically eliminated by the Engineer. Screed the slabs with straightedges to the established grades shown on the Drawings. While the concrete is still green but sufficiently hardened to support a finisher and kneeboards with no more than 1/4-inch indentation, wood float to a true, even plane with no coarse aggregate visible. Use sufficient pressure on the wood floats to bring moisture to the surface.

3. Finishing Tolerances:

a. Level slabs to a tolerance of plus or minus 1/8 inch when checked with a 10-foot straightedge placed anywhere on the slab in any direction. Failure to meet the above requirements shall be cause for removal, grinding, or other correction as directed by the Engineer.

B. Broom Finish

1. Screed slabs with straightedges to the established grades indicated on the Drawings. When the concrete has stiffened sufficiently to maintain small surface indentations, draw a stiff bristle broom lightly across the surface in the direction of drainage or, in the case of walks and stairs, perpendicular to the direction of traffic to provide a non-slip surface.

C. Steel Trowel Finish

1. Finish concrete as specified in Article 3.04. Then, hand steel trowel to a perfectly smooth, hard, even finish free from high or low spots or other defects.

D. Concrete Sealer

1. Prepare and seal surfaces indicated on the room finish schedule to receive a sealer as follows:

a. Finish concrete as specified in the preceding paragraphs and in accordance with the Schedule in Article 3.13.
b. Newly Placed Concrete: Surface must be sound and properly finished. Surface is application ready when it is damp but not wet and can no longer be marred by walking workmen.
c. Newly Cured Bare Concrete: Level any spots gouged out by trades. Remove all dirt, dust, droppage, oil, grease, asphalt, and foreign matter. Cleanse with caustics and detergents as required. Rinse thoroughly and allow to dry so that surface is no more than damp and not wet.
d. Aged Concrete: Restore surface soundness by patching, grouting, filling cracks and holes, etc. Surface must also be free of any dust, dirt, and other foreign matter. Use power tools and/or strippers to remove any incompatible sealers or coatings. Cleanse as required following the procedure indicated under cured concrete.
e. Methods: Apply sealer to form a continuous, uniform film by spray, soft bristle pushbroom, long nap roller, or lambswool applicator. Ordinary garden type sprayers, using neoprene hose, are recommended for best results.
f. Applications: For curing only, apply the first coat evenly and uniformly as soon as possible after final finishing at the rate of 200 to 400 square feet per gallon. Apply the second coat when all trades are completed and the structure is ready for occupancy at the rate of 400 to 600 square feet per gallon.
g. To meet guarantee and to seal and dustproof, two coats are required. For sealing new concrete, both coats shall be applied full strength. On aged concrete, when renovating, dustproofing, and sealing, the first coat should be thinned 10 to 15% with reducer in accordance with the manufacturer's directions.

3.09 CONCRETE RECEIVING CHEMICAL HARDENER (NOT USED)

3.10 APPROVAL OF FINISHES

A. All concrete surfaces, when finished, will be examined by the Engineer.

B. Surfaces which in the opinion of the Engineer are unsatisfactory shall be refinished or reworked.

C. After finishing horizontal surfaces, regardless of the finishing procedure specified, the concrete shall be cured in compliance with this Section unless otherwise directed by the Engineer.

1. Interior or Exterior Horizontal Concrete not Requiring Floor Hardener or Sealer: Floated finish. See Paragraph 3.08D.
2. Concrete for Exterior Walks and Interior and Exterior Stairs: Broomed finish perpendicular to direction of traffic. See Paragraph 3.08B.
3. Concrete Slabs On Which Process Liquids Flow or In Contact with Sludge: Steel trowel finish. See Paragraph 3.08C.

3.11 CURING AND PROTECTION

A. The Contractor shall protect all concrete work against injury from the elements and defacements of any nature during construction operations.

B. Curing Methods

1. Curing Methods for Concrete Surfaces: Cure concrete to retain moisture and maintain specified temperature at the surface for a minimum of 7 days after placement. Curing methods to be used are as follows:

a. Water Curing: Keep entire concrete surface wet by ponding, continuous sprinkling, or by covering with saturated burlap. Begin wet cure as soon as concrete attains an initial set and maintain wet cure 24 hours a day.
b. Sheet Material Curing: Cover entire surface with sheet material. Securely anchor sheeting to prevent wind and air from lifting the sheeting or entrapping air under the sheet. Place and secure sheet as soon as initial concrete set occurs.
c. Liquid Membrane Curing: Apply over the entire concrete surface except for surfaces to receive additional concrete. DO NOT place curing compound on any concrete surface where additional concrete is to be placed or where concrete sealers or surface coatings are to be used. Apply curing compound as soon as the free water on the surface has disappeared and no water sheen is visible, but not after the concrete is dry or when the curing compound can be absorbed into the concrete. Application shall be in compliance with the manufacturer's recommendations.

C. Finished surfaces and slabs shall be protected from the direct rays of the sun to prevent checking and crazing.

D. Cold Weather Concreting

1. *Cold weather* is defined as a period when the average daily outdoor temperature drops below 40°F for more than 3 successive days. The average daily temperature shall be calculated as the average of the highest and the lowest temperature during the period from midnight to midnight.

2. Cold weather concreting shall conform to ACI 306.1 and the additional requirements specified in this Section. Temperatures at the concrete placement shall be recorded at 12-hour intervals (minimum).

3. The Contractor shall discuss a cold weather work plan with the Engineer. The discussion shall encompass the methods and procedures proposed for use during cold weather, including the production, transportation, placement, protection, curing, and temperature monitoring of the concrete. The procedures to be implemented upon abrupt changes in weather conditions or equipment failures shall also be discussed. Cold weather concreting shall not begin until the work plan is acceptable to the Engineer.

4. During periods of cold weather, concrete shall be protected to provide continuous warm, moist curing (with supplementary heat when required) for a total of at least 350 degree-days of curing.

    a. *Degree-days* are defined as the total number of 24-hour periods multiplied by the weighted average daily air temperature at the surface of the concrete (e.g., 5 days at an average of 70°F = 350 degree-days).
    b. To calculate the weighted average daily air temperature, sum hourly measurements of the air temperature in the shade at the surface of the concrete taking any measurement less than 50°F as 0°F. Divide the sum thus calculated by 24 to obtain the weighted average temperature for that day.

5. Salt, manure, or other chemicals shall not be used for protection.

6. The protection period for concrete being water cured shall not be terminated during cold weather until at least 24 hours after water curing has been terminated.

E. Hot Weather Concreting

1. *Hot weather* is defined as any combination of high air temperatures, low relative humidity, and wind velocity which produces a rate of evaporation

estimated in accordance with ACI 305R, approaching or exceeding 0.2 pound/square foot/hour).

2. Concrete placed during hot weather shall be batched, delivered, placed, cured, and protected in compliance with the recommendations of ACI 305R and the additional requirements specified in this Section.

    a. Temperature of concrete being placed shall not exceed 90°F and every effort shall be made to maintain a uniform concrete mix temperature below this level. The temperature of the concrete shall be such that it will cause no difficulties from loss of slump, flash set, or cold joints.
    b. All necessary precautions shall be taken to deliver the concrete promptly, to place the concrete promptly upon its arrival at the job, and to provide vibration immediately after placement.
    c. The Engineer may direct the Contractor to immediately cover plastic concrete with sheet material.

3. The Contractor shall discuss with the Engineer a work plan describing the methods and procedures proposed to use for concrete placement and curing during hot weather. Hot weather concreting shall not begin until the work plan is acceptable to the Engineer.

3.12 STRIPPING AND FINISHING CONCRETE

A. Forms shall not be stripped before the concrete has attained a strength of at least 30% of the specified design strength, unless otherwise approved by the Engineer. This is equivalent to approximately "100 day-degrees" of moist curing.

B. Shores shall not be removed until the concrete has attained at least 70% of its specified design strength and also sufficient strength to support safely its own weight and construction live loads.

C. Care shall be exercised to prevent damaging edges or obliterating the lines of chamfers, rustications, or corners when removing the forms or doing any other adjacent work.

D. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete to the satisfaction of the Engineer.

E. As soon as forms have been stripped, remove form ties, if employed, and fill the recess to ensure complete watertightness. Chip out and repair any defects in the surface of the walls in a workmanlike manner. Defective concrete where it occurs shall be cut to a minimum depth of 1 inch, thoroughly roughened, and neat

cement brushed in. The hole shall then be filled with mortar in the proportion of 1 part cement and 2-1/2 parts sand with a minimum of water. Mortar for filling form tie recesses shall be mixed to a slightly damp consistency (just short of "balling"), pressed into the recess until dense, and troweled smooth. Mortar in larger patches shall be applied and allowed to assume a partial set following which it shall be struck off flush with the adjoining surface. Patches shall be kept moist for several days to ensure proper curing.

F. Top surface of slabs shall be screeded to the established grades and shall be a true plane with a tolerance of 1/8 inch when checked with a 10-foot straightedge. The surface shall be finished to give a smooth, hard, even surface free from high or low spots or other defects. Failure to meet the condition shall be cause for removal, grinding, or other correction as directed by the Engineer.

G. Concrete to receive Liner System shall be finished in strict accordance with the manufacturer's recommendations.

3.13 SCHEDULE

A. The following (Table 3) are the general applications for the various concrete classes and design strengths:

TABLE 3
CONCRETE SCHEDULE

Class	Design Strength (psi)	Description
A	2,500	Concrete fill and duct encasement.
B	3,000	Concrete overlay slabs and curbs/pavements.
C	4,000	Slabs on grade, precast lids, and all other structural concrete.
D	5,000	Prestressed concrete.

3.14 MISCELLANEOUS WORK

A. Sleeve steel work required to be set in the concrete forms for attachment of structural and miscellaneous equipment shall be set or installed under this Division. The Contractor shall be fully responsible for the setting of such materials in the forms and shall correct all such materials not installed in a proper location or manner at his own expense.

END OF SECTION

DIVISION 5

METALS

SECTION 05500
METAL FABRICATIONS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes the following:

1. Metal ladders.
2. Ladder safety cages.
3. Metal bollards.
4. Loose bearing and leveling plates.
5. Shelf and relieving angles.
6. Miscellaneous framing and supports.
7. Prefabricated steel building columns.
8. Steel channels for overhead door openings.
9. Stair nosings.
10. Loose steel lintels.
11. Gratings.
12. Access hatches.

B. Products furnished, but not installed, under this Section include the following:

1. Anchor bolts, steel pipe sleeves, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product Data: For the following:

1. Non-slip aggregates and non-slip-aggregate surface finishes.
2. Prefabricated building columns.
3. Metal nosings and treads.
4. Paint products.
5. Grout.

B. Shop Drawings: Show fabrication and installation details for metal fabrications.

1. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.
2. Provide templates for anchors and bolts specified for installation under other Sections.
3. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Verification: For each type and finish of extruded nosing.

D. Mill Certificates: Signed by the manufacturers of stainless-steel sheet certifying that products furnished comply with requirements.

E. Welding certificates.

F. Qualification Data: Florida Professional Engineering Registration certificate.

1.03 WORK SEQUENCE

A. The Contractor shall coordinate the installation of anchorages for metal fabrications. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to the Project site in time for installation.

B. The Contractor shall coordinate the installation of steel weld plates and angles for casting into concrete that are specified in this Section but required for work of another Section. Deliver such items to the Project site in time for installation.

1.04 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American National Standards Institute (ANSI)

1. ANSI A14.3—Ladders – Fixed – Safety Requirements.

B. American Society for Testing and Materials (ASTM)

1. ASTM A27/A27M—Standard Specification for Steel Castings, Carbon, for General Application.
2. ASTM A36/A36M—Standard Specification for Carbon Structural Steel.
3. ASTM A47/A47M—Standard Specification for Ferritic Malleable Iron Castings.
4. ASTM A48/A48M—Standard Specification for Gray Iron Castings.
5. ASTM A53/A53M—Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
6. ASTM A123/A123M—Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
7. ASTM A153/A153M—Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
8. ASTM A276/A276M—Standard Specification for Stainless Steel Bars and Shapes.
9. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
10. ASTM A489—Standard Specification for Carbon Steel Lifting Eyes.
11. ASTM A500/A500M—Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
12. ASTM A563—Standard Specification for Carbon and Alloy Steel Nuts.
13. ASTM A653/A653M—Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
14. ASTM A666—Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
15. ASTM A780/A780M—Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
16. ASTM A786/A786M—Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
17. ASTM B108/B108M—Standard Specification for Aluminum-Alloy Permanent Mold Castings.
18. ASTM B209—Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
19. ASTM B221—Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
20. ASTM B241/B241M—Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube.
21. ASTM B633—Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
22. ASTM C1107/C1107M—Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

23. ASTM D1187/D1187M—Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
24. ASTM E488/E488M—Standard Test Methods for Strength of Anchors in Concrete Elements.
25. ASTM F436/F436M—Standard Specification for Hardened Steel Washers.
26. ASTM F593—Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
27. ASTM F594—Standard Specification for Stainless Steel Nuts.
28. ASTM F836M—Standard Specification for Style 1 Stainless Steel Metric Nuts (Metric).
29. ASTM F879—Standard Specification for Stainless Steel Socket Button and Flat Countersunk Head Cap Screws.
30. ASTM F1554—Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
31. ASTM F3125/F3125M—Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830 MPa) and 150 ksi (1,040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.

C. American Society of Mechanical Engineers (ASME)

1. ASME B18.2.1—Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series).
2. ASME B18.2.3.8M—Metric Hex Lag Screws.
3. ASME B18.6.1—Wood Screws (Inch Series).
4. ASME B18.6.3—Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch Series).
5. ASME B18.6.7M—Metric Machine Screws.
6. ASME B18.21.1—Washes: Helical Spring-Lock, Tooth Lock, and Plain Washers (Inch Series).
7. ASME B18.21.2M—Lock Washers (Metric Series).
8. ASME B18.22.1—Plain Washers.
9. ASME B18.22M—Metric Plain Washers.

D. American Welding Society (AWS)

1. AWS D1.1/D1.1M—Structural Welding Code – Steel.
2. AWS D1.2/D1.2M—Structural Welding Code – Aluminum.
3. AWS D1.3/D1.3M—Structural Welding Code – Sheet Steel.
4. AWS D1.6/D1.6M—Structural Welding Code – Stainless Steel.

E. Environmental Protection Agency (EPA)

1. EPA Method 24—Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings.

F. Federal Regulations (FR)

1. 40 CFR 59—National Volatile Organic Compound Emission Standards for Consumer and Commercial Products.

G. National Association of Architectural Metal Manufacturers (NAAMM)

1. NAAMM MBG 531—Metal Bar Grating Manual.

H. Society for Protection Coatings (SSPC)

1. SSPC-PA1—Shop, Field, and Maintenance Painting of Steel.
2. SSPC-SP6/NACE No. 3—Commercial Blast Cleaning.
3. SSPC-SP10/NACE No. 2—Near-White Blast Cleaning.
4. SSPC-Paint 20—Zinc-Rich Primers Type I Inorganic and Type II Organic.
5. SSPC-Paint 29—Zinc Dust Sacrificial Primer, Performance-Based.
6. SSPC-Zone 1A—Interior, Normally Dry.
7. SSPC-Zone 1B—Exterior, Normally Dry.

I. Specialty Steel Industry of North America (SSINA)

1. SSINA No. 6 Finish—Satin Finish.

1.05 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, Structural Welding Code—Steel.
2. AWS D1.2/D1.2M, Structural Welding Code—Aluminum.
3. AWS D1.3/D1.3M, Structural Welding Code—Sheet Steel.
4. AWS D1.6/D1.6M, Structural Welding Code—Stainless Steel.

1.06 PROJECT REQUIREMENTS

A. Structural Performance of Ladders: The Contractor shall provide ladders capable of withstanding the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.

B. Thermal Movements: Provide exterior metal fabrications that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120°F, ambient; 180°F, material surfaces.

1.07 PROJECT CONDITIONS

A. Field Measurements: The Contractor shall verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication and indicate measurements on shop drawings.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate wall and other contiguous construction to ensure that actual dimensions correspond to established dimensions.
2. Provide allowance for trimming and fitting at site.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 Articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include but are not limited to products specified.
2. Products: Subject to compliance with requirements, provide one of the products specified.
3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include but are not limited to manufacturers specified.
4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.02 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For metal fabrications exposed to view in the completed

Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.03 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

1. Unless noted otherwise, steel that is not stainless steel shall be galvanized with a G90 coating conforming to ASTM A123/A123M.

B. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A666, Type 316L.

C. Stainless-Steel Bars and Shapes: ASTM A276/A276M, Type 316L.

D. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.

E. Steel Pipe: ASTM A53/A53M, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.

2.04 ALUMINUM ALLOY PRODUCTS

A. Aluminum Sheet Plates: Conforming to ASTM B209.
B. Aluminum Extrusions: Conforming to ASTM B221.
C. Aluminum Castings: Conforming to ASTM B108/B108M.

2.05 FASTENERS

A. General: For all exterior applications and where fastening aluminum, provide Type 304 stainless-steel fasteners. Provide hot-dipped galvanized fasteners in all other applications in accordance with ASTM A153/A153M unless noted otherwise on the Drawings. Select fasteners for type, grade, and class required.

B. High-Strength Bolts and Nuts: ASTM F3125/F3125M with heavy hex nuts ASTM A563 and hardened carbon-steel washers ASTM F436/F486M.

C. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A (Property Class 4.6); with hex nuts, ASTM A563 (ASTM A563M); and, where indicated, flat washers.

D. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, nuts, and flat washers; ASTM F593 for bolts and ASTM F594 for nuts, Alloy Group A4.

E. Stainless Steel Socket Button and Flat Countersunk Head Cap Screws: ASTM F879.

F. Anchor Bolts: ASTM F 1554, Grade 36.

G. Eyebolts: ASTM A489.

H. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).

I. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

J. Wood Screws: Flat head, ASME B18.6.1.

K. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M).

L. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M).

M. Cast-in-Place Anchors in Concrete: Anchors capable of sustaining without failure a load equal to four times the load imposed, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.

1. Threaded or wedge type; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized in accordance with ASTM A153/A153M.

N. Expansion Anchors: Anchor bolt and sleeve assembly with ability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M conducted by a qualified independent testing agency.

1. Material for Anchors in Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B633, Class Fe/Zn 5.
2. Material for Anchors in Exterior Locations: Alloy Group (A4) stainless-steel bolts complying with ASTM F593 and nuts complying with ASTM F594 (ASTM F836M).

2.06 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Shop Primers: Provide primers that comply with Division 9, Finishes.

C. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.

1. Use primer with a VOC content of 3.5 pounds/gallon or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2. Available Products:

a. Benjamin Moore & Co.; Epoxy Zinc-Rich Primer CM18/19.
b. Carboline Company; Carbozinc 621.
c. ICI Devoe Coatings; Catha-Coat 313.
d. International Coatings Limited; Interzinc 315 Epoxy Zinc-Rich Primer.
e. PPG Architectural Finishes, Inc.; Aquapon Zinc-Rich Primer 97-670.
f. Sherwin-Williams Company (The); Corothane I GalvaPac Zinc Primer.
g. Tnemec Company, Inc.; Tneme-Zinc 90-97.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

E. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

F. Nonshrink, Metallic Grout: Factory-packaged, ferrous-aggregate grout complying with ASTM C1107/C1107M, specifically recommended by the manufacturer for heavy-duty loading applications.

G. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by the manufacturer for interior and exterior applications.

2.07 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to the greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work true to line and level with accurate angles, surfaces, and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts, unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that will be exposed to weather so as to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of the type indicated and coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

1. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 inch by 1-1/2 inches with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.08 METAL BOLLARDS

A. Steel Pipe Bollards: Fabricate pipe bollards from Schedule 80 steel pipe. Fill bollards with concrete.

1. Where bollards are indicated to receive push-button controls for door operators, provide necessary cutouts for push-button controls and hole for wire.

B. Fabricate bollards with 3/8-inch-thick steel base plates for bolting to concrete slab. Drill baseplates at all four corners for 3/4-inch anchor bolts.

1. Where bollards are to be anchored to sloping concrete slabs, angle baseplates for plumb alignment of bollards.

C. Fabricate sleeves for bollard anchorage from steel pipe or tubing with 1/4-inch-thick steel plate welded to bottom of sleeve. Make sleeves not less than 8 inches deep and 3/4 inch larger than OD of bollard.

D. Fabricate internal sleeves for removable bollards from Schedule 40 steel pipe or 1/4-inch wall-thickness steel tubing with an OD approximately 1/16 inch less than ID of bollards. Match drill sleeve and bollard for 3/4-inch steel machine bolt.

2.09 MISCELLANEOUS METAL FABRICATIONS

A. Loose Bearing and Leveling Plates: Flat, free from warps or twists, and of the required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.

B. Miscellaneous Framing and Supports

1. Provide steel framing and supports for applications indicated that are not a part of structural steel framework as required to complete the Work.
2. Fabricate units to sizes, shapes, and profiles indicated and required to receive other adjacent construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items.
3. Galvanize miscellaneous framing and supports in all locations.

2.10 FINISHES, GENERAL

A. Comply with NAAMM's *Metal Finishes Manual for Architectural and Metal Products* for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.11 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

1. ASTM A123/A123M, for galvanizing steel and iron products.
2. ASTM A153/A153M, for galvanizing steel and iron hardware.

B. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Exteriors (SSPC Zone 1B) and Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3.
2. Interiors (SSPC Zone 1A): SSPC-SP 10.

C. Shop Priming: Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1 for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

2.12 STAINLESS STEEL FINISHES

A. Remove tool and die marks and stretch lines or blend into finish.

B. Dull Satin Finish: SSINA No. 6 Finish.

C. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

PART 3 EXECUTION

3.01 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that will come into contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.

3.02 INSTALLING METAL BOLLARDS

A. Anchor bollards to existing construction with anchor bolts. Provide four 3/4-inch bolts at each bollard, unless otherwise indicated.

1. Embed anchor bolts at least 4 inches in concrete.

B. Anchor bollards in concrete in formed or core-drilled holes not less than 8 inches deep and 3/4 inch larger than OD of bollard. Fill annular space around bollard solidly with nonshrink, nonmetallic grout mixed and placed to comply with the grout manufacturer’s written instructions. Slope grout up approximately 1/8 inch toward bollard.

C. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inches above the bottom of the excavation. Place concrete and vibrate or

tamp for consolidation. Support and brace bollards in position until the concrete has cured.

D. Anchor internal sleeves for removable bollards in formed or core-drilled holes not less than 8 inches deep and 3/4 inch larger than OD of sleeve. Fill annular space around internal sleeves solidly with nonshrink, nonmetallic grout; mixed and placed to comply with grout manufacturer's written instructions. Slope grout up approximately 1/8 inch toward internal sleeve.

E. Anchor internal sleeves for removable bollards in place with concrete footings. Center and align sleeves in holes 3 inches above the bottom of the excavation. Place concrete and vibrate or tamp for consolidation. Support and brace sleeves in position until concrete has cured.

F. Place removable bollards over internal sleeves and secure with 3/4-inch machine bolts and nuts. After tightening nuts, drill holes in bolts for inserting padlocks. The Owner will furnish padlocks.

G. Fill bollards solidly with concrete, mounding top surface to shed water.

1. Do not fill removable bollards with concrete.

3.03 INSTALLING BEARING AND LEVELING PLATES

A. The Contractor shall clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean the bottom surface of bearing plates.

B. Set loose leveling and bearing plates on wedges or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if they are protruding cut off flush with the edge of the bearing plate before packing with grout.

1. Use non-shrink, metallic grout in concealed locations where not exposed to moisture; use non-shrink, nonmetallic grout in exposed locations, unless otherwise indicated.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.04 ADJUSTING AND CLEANING

The Contractor shall do the following:

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9, Finishes.

C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION

DIVISION 9

FINISHES

SECTION 09900
PAINTING AND COATING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes materials for and application of painting and coating systems for the following surfaces:

1. Buried metal.
2. PVC.

B. It does not include coating steel water tanks and reservoirs.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. Submit manufacturer's data sheets showing the following information:

1. Percent solids by volume.
2. Minimum and maximum recommended dry-film thickness per coat for prime, intermediate, and finish coats.
3. Recommended surface preparation.
4. Recommended thinners.
5. Statement verifying that the specified prime coat is recommended by the manufacturer for use with the specified intermediate and finish coats.
6. Application instructions including recommended equipment and temperature limitations.
7. Curing requirements and instructions.

C. Submit color swatches.

D. Submit certificate identifying the type and gradation of abrasives used for surface preparation.

E. Submit material safety data sheets for each coating.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM A780/A780M—Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
2. ASTM C501—Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser.
3. ASTM D520—Standard Specification for Zinc Dust Pigment.
4. ASTM D522/D522M—Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings.
5. ASTM D1002—Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal).
6. ASTM D2240—Standard Test Method for Rubber Property—Durometer Hardness.
7. ASTM D2697—Standard Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings.
8. ASTM D2794—Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
9. ASTM D3734—Standard Specification for High-Flash Aromatic Naphthas.
10. ASTM D4060—Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser.
11. ASTM D4138—Standard Practices for Measurement of Dry Film Thickness of Protective Coating Systems by Destructive, Cross-Sectioning Means.
12. ASTM D4258—Standard Practice for Surface Cleaning Concrete for Coating.
13. ASTM D4260—Standard Practice for Liquid and Gelled Acid Etching of Concrete.
14. ASTM D4261—Standard Practice for Surface Cleaning Concrete Masonry Units for Coating.
15. ASTM D4263—Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
16. ASTM D4787—Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates.

17. ASTM D6386—Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
18. ASTM D7091—Standard Practice for Nondestructive Measurement of Dry Film Thickness of Nonmagnetic Coatings Applied to Ferrous Metals and Nonmagnetic, Nonconductive Coatings Applied to Non-Ferrous Metals.
19. ASTM E84—Standard Test Method for Surface Burning Characteristics of Building Materials.

B. American Water Works Association (AWWA)

1. AWWA C203—Coal-Tar Protective Coatings and Linings for Steel Water Pipe.
2. AWWA C209—Tape Coatings for Steel Water Pipe and Fittings.

C. International Concrete Repair Institute (ICRI)

1. ICRI CSP 3-5—Light to Medium-Heavy Shotblast.
2. ICRI CSP 5—Medium-Heavy Shotblast.

D. National Association of Corrosion Engineers International (NACE)

1. NACE No. 6—Surface Preparation of Concrete.
2. NACE SP0188—Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.

E. NSF International (NSF)

1. NSF 61/600—Drinking Water System Components – Health Effects.

F. Steel Structure Painting Council (SSPC)

1. SSPC PA-1—Shop, Field, and Maintenance Coating of Metals.
2. SSPC PA-2—Procedure for Determining Conformance to Dry Coating Thickness Requirements.
3. SSPC SP-1—Solvent Cleaning.
4. SSPC SP-2—Hand Tool Cleaning.
5. SSPC SP-3—Power Tool Cleaning.
6. SSPC SP-5/NACE No. 1—White Metal Blast Cleaning.
7. SSPC SP-6/NACE No. 3—Commercial Blast Cleaning.
8. SSPC SP-7/NACE No. 4—Brush-Off Blast Cleaning.
9. SSPC SP-8—Pickling.

10. SSPC SP-10/NACE No. 2—Near-White Metal Wet Abrasive Blast Cleaning.
11. SSPC SP-11—Power-Tool Cleaning to Bare Metal.
12. SSPC SP WJ-1—Waterjet Cleaning of Metals – Clean to Bare Substrate.
13. SSPC SP WJ-2—Waterjet Cleaning of Metals – Very Thorough Cleaning.
14. SSPC SP WJ-3—Waterjet Cleaning of Metals – Thorough Cleaning.
15. SSPC SP WJ-4—Waterjet Cleaning of Metals – Light Cleaning.

G. U.S. Department of Defense (MIL)

1. MIL-C-18480B—Coating Compound, Bituminous, Solvent, Coal-Tar Base.
2. MIL-DTL-5541F—Chemical Conversion Coatings on Aluminum and Aluminum Alloys.
3. MIL-P-21035B—Paint High Zinc Dust Content, Galvanizing Repair.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

PART 2 MATERIALS

2.01 PAINTING AND COATING SYSTEMS

The following index lists the various painting and coating systems by service and generic type:

PAINT COATINGS SYSTEM INDEX		
No.	Title	Generic Coating
Buried Metal Coating Systems		
21.	Buried Metal	Epoxy
24.	Buried Metal	Corrosion-resisting grease
PVC Coating System		
41.	PVC, Ultraviolet Exposure or Color Coding	Polyurethane

These systems are specified in detail in the following Paragraphs. For each coating, the required surface preparation, prime coat, intermediate coat (if required), topcoat, and coating thicknesses are described. Mil thicknesses shown are minimum dry-film thicknesses.

A. Buried Metal Coating Systems

1. System No. 21—Buried Metal:

a. Type: High solids Cycloaliphatic Amine epoxy or phenolic epoxy having minimum volume solids of 80% (ASTM D2697).
b. Service Conditions: Buried metal, such as valves, flanges, bolts, nuts, structural steel, and fittings.
c. Surface Preparation: Solvent clean in accordance with SSPC SP-1 to remove contaminants from the surface. Abrasive blast in accordance with SSPC SP-10.
d. Coating System: Apply three or more coats of Ameron 400; Tnemec 104 HS (6.0 to 8.0 mils per coat); ICI Devoe Bar-Rust 233H; Carboline 890LT; Sherwin-Williams Tank Clad HS B62-80 Series/B60V80 Series at 5.0 to 8.0 mils/coat or equal; 30 mils total. Maximum thickness of an individual coating shall not exceed the manufacturer's recommendation.

2. System No. 24—Buried Metal:

a. Type: Corrosion-resisting grease.
b. Service Conditions: Buried metal, such as bolts, bolt threads, tie rods, and nuts.
c. Surface Preparation: Solvent clean in accordance with SSPC SP-1 to remove contaminants from the surface. Power tool clean in accordance with SSPC SP-3 as a minimum. Abrasive blasting in accordance with SSPC-SP-6/NACE No. 3 is preferred.
d. Coating: NO-OX-ID GG-2 as manufactured by Sanchem, Inc. Apply to a minimum thickness of 1/4 inch.

B. PVC Coating System

1. System No. 41—PVC, Ultraviolet Exposure or Color Coding:

a. Type: Epoxy primer with minimum volume solids of 54% and a pigmented polyurethane enamel having a minimum volume solids of 66%.

b. Service Conditions: Color coding of PVC or exposed to sunlight.
c. Surface Preparation: Clean the surface per SSPC SP-1, Solvent Cleaning. Then, lightly abrade the surface with medium-grain sandpaper.
d. Prime Coat: One coat of Tnemec Series N69 Epoxoline; International 7510; Ameron 385; ICI Devoe Devran 224 HS; Sherwin-Williams Macropoxy 646 B58 Series/B58V600 at 5.0 to 8.0 mils DFT; Carboline 888 or 890; PPG PITT-GUARD® Direct-to-Rust Epoxy Mastic Coating 97-145 Series; or equal. Apply to a minimum dry-film thickness of 4 mils.
e. Finish Coat: One coat of Tnemec Series 1075; International Interthane 990HS; Ameron 450 HS; ICI Devoe Devran 379; Carboline 134 HG; Sherwin-Williams Hi-Solids Polyurethane B65-300 Series/B60V30 at 3.0 to 4.0 mils DFT; PPG PITTHANE® Ultra-Gloss Urethane Enamel 95-812 Series; or equal. Apply to a minimum dry-film thickness of 3 mils.

C. Abrasives for Surface Preparation

1. Abrasives used for preparation of ferrous (excluding stainless steel) surfaces shall be one of the following:

a. 16- to 30- or 16- to 40-mesh silica sand or mineral grit.
b. 20- to 40-mesh garnet.
c. Crushed iron slag, 100% retained on No. 80 mesh.
d. SAE Grade G-40 or G-50 iron or steel grit.

2. Abrasives used for preparation of stainless steel surfaces shall be 20- to 40-mesh silicon carbide or aluminum oxide.

3. Abrasives used for preparation of concrete and masonry surfaces shall be 16- to 30- or 16- to 40-mesh silica sand.

4. In the above gradations, 100% of the material shall pass through the first stated sieve size and 100% shall be retained on the second stated sieve size.

PART 3 EXECUTION

3.01 WEATHER CONDITIONS

A. Do not paint in the rain, wind, snow, mist, or fog or when steel or metal surface temperatures are less than 5°F above the dew point.

B. Do not apply paint when the relative humidity is above 85%.

C. Do not paint when temperature of metal to be painted is above 120°F.

D. Do not apply alkyd, inorganic zinc, silicone aluminum, or silicone acrylic paints if air or surface temperature is below 40°F or expected to be below 40°F within 24 hours.

E. Do not apply epoxy, acrylic latex, and polyurethane paints on an exterior or interior surface if air or surface temperature is below 60°F or expected to drop below 60°F in 24 hours.

3.02 SURFACE PREPARATION PROCEDURES

A. Remove oil and grease from metal surfaces in accordance with SSPC SP-1. Use clean cloths and cleaning solvents and wipe dry with clean cloths. Do not leave a film or greasy residue on the cleaned surfaces before abrasive blasting. Powerwashing with a biodegradable degreaser is also acceptable.

B. Remove weld spatter and weld slag from metal surfaces and grind smoothly rough welds, beads, peaked corners, and sharp edges including erection lugs in accordance with SSPC SP-2 and SSPC SP-3. Grind 0.020 inch (minimum) off the weld caps on pipe weld seams. Grind outside sharp corners, such as the outside edges of flanges, to a minimum radius of 1/4 inch.

C. Do not abrasive blast or prepare more surface area in one day than can be coated in one day; prepare surfaces and apply coatings the same day. Remove sharp edges, burrs, and weld spatter. Prime all areas before rust bloom forms and within the same day.

D. Do not abrasive blast PVC piping or equipment. Do not abrasive blast epoxy- or enamel-coated pipe that has already been factory coated, except to repair scratched or damaged coatings.

E. For carbon steel, do not touch the surface between the time of abrasive blasting and the time the coating is applied. Apply coatings within 2 hours of blasting or before any rust bloom forms.

F. Surface preparation shall conform to the SSPC specifications as follows:

Solvent Cleaning	SP-1
Hand Tool Cleaning	SP-2
Power Tool Cleaning	SP-3
White Metal Blast Cleaning	SP-5
Commercial Blast Cleaning	SP-6

Brush-Off Blast Cleaning	SP-7
Pickling	SP-8
Near-White Blast Cleaning	SP-10
Power Tool Cleaning to Bare Metal	SP-11
Surface Preparation of Concrete	SP-13
Waterjet Cleaning of Metals – Clean to Bare Substrate	SP WJ-1
Waterjet Cleaning of Metals – Very Thorough Cleaning	SP WJ-2
Waterjet Cleaning of Metals – Thorough Cleaning	SP WJ-3
Waterjet Cleaning of Metals – Light Cleaning	SP WJ-4

G. Wherever the words "solvent cleaning," "hand tool cleaning," "wire brushing," or "blast cleaning" or similar words are used in these Specifications or in the paint manufacturer's specifications, they shall be understood to refer to the applicable SSPC (Steel Structure Painting Council), surface preparation specifications listed above.

H. *Dust blasting* is defined as cleaning the surface through the use of very fine abrasives, such as siliceous or mineral abrasives, 80 to 100 mesh. Apply a fine etch to the metal surface to clean the surface of any contamination or oxide and to provide a surface profile for the coating.

I. *Brush-off blasting* of concrete and masonry surfaces is defined as opening subsurface holes and voids and etching the surface for a coating to bond.

J. For carbon steel surfaces, after abrasive blast cleaning, the height of the surface profile shall be 2 to 3 mils. Verify the surface profile by measuring with an impresser tape acceptable to the Owner's Representative. Perform a minimum of one test per 100 square feet of surface area. Testing shall be witnessed by the Owner's Representative. The impresser tape used in the test shall be permanently marked with the date, time, and locations where the test was made. Test results shall be promptly presented to the Owner's Representative.

K. Do not apply any part of a coating system before the Owner's Representative has reviewed the surface preparation. If coating has been applied without this review, if directed by the Owner's Representative, remove the applied coating by abrasive blasting and reapply the coat in accordance with this Specification.

3.03 ABRASIVE BLAST CLEANING

A. Use dry abrasive blast cleaning for metal surfaces. Do not use abrasives in automatic equipment that have become contaminated. When shop or field blast cleaning with handheld nozzles, do not recycle or reuse blast particles.

B. After abrasive blast cleaning and before coating is applied, dry clean surfaces to be coated by dusting, sweeping, and vacuuming to remove residue from blasting.

Apply the specified primer or touch-up coating within an 8-hour working day. Do not apply coating over damp or moist surfaces. Reclean any blast-cleaned surface not coated within the 8-hour period before applying primer or touch-up coating.

C. Keep the area of the work in a clean condition and do not permit blasting particles to accumulate and constitute a nuisance or hazard.

D. During abrasive blast cleaning, prevent damage to adjacent coatings. Schedule blast cleaning and coating so that dust, dirt, blast particles, old coatings, rust, mill scale, etc., will not damage or fall upon wet or newly coated surfaces.

3.04 COATING STAINLESS STEEL

A. Solvent clean in accordance with SSPC SP-1. Solvents and cleaning solutions shall contain less than 200 mg/l of halogens. Then abrasive blast to give a surface profile of 2.0 to 3.0 mils. Refer to the coatings for the correct surface profile. Use coatings that are low in chloride content.

B. Do not apply inorganic zinc primers to stainless steel if such primers are specified in the painting system required. Apply only the intermediate and finish coats in such cases.

3.05 PROCEDURES FOR ITEMS HAVING SHOP-APPLIED PRIME COATS

A. After applying primer to surfaces, allow coating to cure for a minimum of 2 hours before handling to minimize damage.

B. When loading for shipment to the project site, use spacers and other protective devices to separate items to prevent damaging the shop-primed surfaces during transit and unloading. If wood spacers are used, remove wood splinters and particles from the shop-primed surfaces after separation. Use padded chains or ribbon binders to secure the loaded items and minimize damage to the shop-primed surfaces.

C. Cover shop-primed items 100% with protective coverings or tarpaulins to prevent deposition of road salts, fuel residue, and other contaminants in transit.

D. Handle shop-primed items with care during unloading, installation, and erection operations to minimize damage. Do not place or store shop-primed items on the ground or on top of other work unless the ground or work is covered with a protective covering or tarpaulin. Place shop-primed items above the ground upon platforms, skids, or other supports.

3.06 PAINTING SYSTEMS

A. All materials of a specified painting system, including primer, intermediate, and finish coats, shall be produced by the same manufacturer. Thinners, cleaners, driers, and other additives shall be as recommended by the paint manufacturer for the particular coating system.

B. Deliver paints to the jobsite in the original, unopened containers.

3.07 PAINT STORAGE AND MIXING

A. Store and mix materials only in areas designated for that purpose by the Owner's Representative. The area shall be well ventilated, with precautionary measures taken to prevent fire hazards. Post "No Smoking" signs. Storage and mixing areas shall be clean and free of rags, waste, and scrapings. Tightly close containers after each use. Store paint at an ambient temperature from 50°F to 100°F.

B. Prepare multiple-component coatings using all of the contents of the container for each component as packaged by the paint manufacturer. Do not use partial batches. Do not use multiple-component coatings that have been mixed beyond their pot life. Provide small quantity kits for touch-up painting and for painting other small areas. Mix only the components specified and furnished by the paint manufacturer. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.

3.08 PROCEDURES FOR THE APPLICATION OF COATINGS

A. Conform to the requirements of SSPC PA-1. Follow the recommendations of the coating manufacturer, including the selection of spray equipment, brushes, rollers, cleaners, thinners, mixing, drying time, temperature and humidity of application, and safety precautions.

B. Stir, strain, and keep coating materials at a uniform consistency during application. Power mix components. For multiple component materials, premix each component before combining. Apply each coating evenly, free of brush marks, sags, runs, and other evidence of poor workmanship. Use a different shade or tint on succeeding coating applications to indicate coverage where possible. Finished surfaces shall be free from defects or blemishes.

C. Do not use thinners unless recommended by the coating manufacturer. If thinning is allowed, do not exceed the maximum allowable amount of thinner per gallon of coating material. Stir coating materials at all times when adding thinner. Do not flood the coating material surface with thinner before mixing. Do not reduce

coating materials more than is absolutely necessary to obtain the proper application characteristics and to obtain the specified dry-film thicknesses.

D. Remove dust, blast particles, and other debris from blast cleaned surfaces by dusting, sweeping, and vacuuming. Allow ventilator fans to clean airborne dust to provide good visibility in working area before applying coating. Remove dust from coated surfaces by dusting, sweeping, and vacuuming before applying succeeding coats.

E. Apply coating systems to the specified minimum dry-film thicknesses as determined in accordance with SSPC PA-2.

F. Apply primer immediately after blast cleaning and before any surface rusting occurs, or any dust, dirt, or any foreign matter has accumulated. Before applying coating, re-clean surfaces that have surface colored or become moist by blast cleaning.

G. Apply a brush coat of primer on welds, sharp edges, nuts, bolts, and irregular surfaces before applying the primer and finish coat. Apply the brush coat before and in conjunction with the spray coat application. Apply the spray coat over the brush coat.

H. Before applying subsequent coats, allow the primer and intermediate coats to dry for the minimum curing time recommended by the manufacturer. In no case shall the time between coats exceed the manufacturer's recommendation.

I. Each coat shall cover the surface of the preceding coat completely and there shall be a visually perceptible difference in applied shade or tint of colors.

J. Applied coating systems shall be cured at 75°F or higher for 48 hours. If temperature is lower than 75°F, curing time shall be in accordance with printed recommendations of the manufacturer, unless otherwise allowed by the Owner's Representative.

K. Assembled parts shall be disassembled sufficiently before painting or coating to ensure complete coverage by the required coating.

3.09 SURFACES NOT TO BE COATED

A. Do not paint the surfaces listed below unless otherwise noted in the drawings or in other Specification sections. Protect the following surfaces during the painting of adjacent areas:

1. Concrete walkways.

2. Stainless steel.
3. Metal letters.
4. Glass.
5. Fencing.
6. Electrical fixtures except for factory coatings.
7. Nameplates.
8. Grease fittings.
9. Buried pipe, unless specifically required in the piping specifications.

3.10 PROTECTION OF SURFACES NOT TO BE PAINTED

A. Remove, mask, or otherwise protect hardware, lighting fixtures, switch plates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be painted. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process. Mask openings in motors to prevent paint and other materials from entering the motors.

3.11 SURFACES TO BE COATED

A. The exact coating to be applied in any location is not designated by the descriptive phrases in the coating system titles such as “corrosive environment,” “buried metal,” or “submerged metal.” Coat surfaces with the specific coating systems as described below:

1. Coat mechanical equipment, such as pumps as described in the various mechanical equipment specifications. The color of the finish coat shall match the color of the connecting piping.
2. Coat aboveground and exposed piping or piping in vaults and structures as described in the various piping specifications as shown in the Piping Schedule in the drawings. The color of the finish coat shall be as shown in the Piping Schedule in the drawings.
3. Coat valves as described in the various valve specifications. Aboveground valves, or valves in vaults and structures, shall match the color of the connecting piping.
4. Coat concrete surfaces where shown in the drawings.
5. Coat buried flanges, nuts and bolts, valves, flexible pipe couplings, exposed rebar in thrust blocks, and valve boxes as specified in the particular specifications for the above items. Coat buried bolt threads, tie bolt threads, and nuts as specified in System No. 24.

3.12 DRY-FILM THICKNESS TESTING

A. Measure coating thickness specified for carbon steel surfaces with a magnetic-type dry-film thickness gauge in accordance with SSPC PA-2. Provide certification that the gauge has been calibrated by a certified laboratory within the past 6 months. Provide dry-film thickness gauge as manufactured by Mikrotest or Elcometer.

B. Test the finish coat of metal surfaces (except zinc primer and galvanizing) for holidays and discontinuities with an electrical holiday detector, low-voltage, wet-sponge type. Provide measuring equipment. Provide certification that the gauge has been calibrated by a certified laboratory within the past 6 months. Provide detector as manufactured by Tinker and Rasor or K-D Bird Dog.

C. Check each coat for the correct dry-film thickness. Do not measure within 8 hours after application of the coating.

D. For metal surfaces, make five separate spot measurements (average of three readings) spaced evenly over each 100 square feet of area (or fraction thereof) to be measured. Make three readings for each spot measurement of either the substrate or the paint. Move the probe or detector a distance of 1 to 3 inches for each new gauge reading. Discard any unusually high or low reading that cannot be repeated consistently. Take the average (mean) of the three readings as the spot measurement. The average of five spot measurements for each such 100 square-foot area shall not be less than the specified thickness. No single spot measurement in any 100-square-foot area shall be less than 80% nor more than 120% of the specified thickness. One of three readings which are averaged to produce each spot measurement may underrun by a greater amount as defined by SSPC PA-2.

E. For concrete surfaces, make five separate spot measurements spaced evenly over each 100 square feet of area (or fraction thereof) to be measured. The average of five spot measurements for each such 100-square-foot area shall not be less than the specified thickness. No single spot measurement in any 100-square-foot area shall be less than 80% nor more than 120% of the specified thickness.

F. Perform tests in the presence of the Owner’s Representative.

3.13 REPAIR OF IMPROPERLY COATED SURFACES

A. If the item has an improper finish color or insufficient film thickness, clean and topcoat the surface with the specified paint material to obtain the specified color and coverage. Sandblast or power-sand visible areas of chipped, peeled, or abraded paint, feathering the edges. Then prime and finish the coat in accordance

with the Specifications. The work shall be free of runs, bridges, shiners, laps, or other imperfections.

3.14 CLEANING

A. During the work, remove discarded materials, rubbish, cans, and rags at the end of each day's work.

B. Thoroughly clean brushes and other application equipment at the end of each period of use and when changing to another paint or color.

C. Upon completion of painting work, remove masking tape, tarps, and other protective materials, using care not to damage finished surfaces.

END OF SECTION

DIVISION 15

MECHANICAL

SECTION 15055
PIPING SYSTEMS—GENERAL

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Specification describes responsibilities and requirements for piping systems including the following:

1. Labor, materials, tools, equipment, and services to be furnished in accordance with the provisions of the Contract Documents. The materials to be used for the piping systems shown in the Drawings are listed by service in the Piping Schedule, included in the Contract Drawings.
2. Coordination of work with other trades.
3. Furnishing and installing all supplementary or miscellaneous items, appurtenances, and devices incidental to or necessary for a sound, secure, and complete installation, although such work is not specifically indicated.
4. Furnishing Record Drawings and documents for piping systems.

1.02 SUBMITTALS

The Contractor shall submit the following in accordance with Section 01330, Submittals and Acceptance:

A. If the Contractor deviates from the piping layout as shown on the Contract Drawings, the Contractor shall submit scaled piping drawings showing locations and dimensions to and from fittings, valves, tanks, equipment, structures, and related appurtenances. Provide scaled drawings to a minimum scale of 1 inch equals 10 feet. Provide details to minimum scale of 1/8 inch equals 1 foot. Elevations shall correspond to reference vertical elevation datum shown or provided for this project.

B. Copies of any manufacturer's written directions regarding material handling, delivery, storage, and installation.

C. Record piping drawings shall meet the requirements of Section 01785, Record Documents. During the work, the Contractor shall maintain accurate, up-to-date Record Drawings of piping systems installed in the project, including pre-existing piping discovered, relocated, or at locations other than as originally shown on the Drawings. When the work is completed and accepted by the Owner and the Engineer, the Contractor shall submit Record Drawings in accordance with Section 01785, Record Documents. The Contractor shall identify complete

location, elevations, and description of piping systems. Piping systems and fittings are to be identified from three points on structures and/or stationary appurtenances.

D. Submit copies of forms documenting required field pressure testing work and results.

E. Submit welding certificate copies.

F. Submit certified copies of mill test reports for bolts and nuts, including coatings if specified. Provide recertification by an independent domestic testing laboratory for materials originating outside of the United States.

G. Submit manufacturer's data sheet for gaskets supplied showing dimensions and bolting recommendations.

H. Support Systems

1. Drawings of each piping system locating each support, guide, and anchor.
2. Identify support, guide, and anchor type by catalog number and shop/ contract drawing detail number.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society of Mechanical Engineers (ASME)

1. ASME B1.1—Unified Inch Screw Threads (UN and UNR Thread Form).
2. ASME B1.20.1—Pipe Threads, General Purpose (Inch).
3. ASME B16.21—Nonmetallic Flat Gaskets for Pipe Flanges.
4. ASME B18.2.1—Square, Hex, Heavy Hex, and Askew Head Bolts, and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series).
5. ASME B18.2.2—Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series).
6. ASME B31.1—Power Piping.
7. ASME B31.3—Process Piping.
8. ASME BPVC—Boiler and Pressure Vessel Code.

B. American Society for Testing and Materials (ASTM)

1. ASTM A183—Specification for Carbon Steel Track Bolts and Nuts.
2. ASTM A193/A193MM—Standard Specification for Alloy-Steel; and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.
3. ASTM A194/A194M—Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High-Pressure or High-Temperature Service, or Both.
4. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength.
5. ASTM D1330—Standard Specification for Rubber Sheet Gaskets.
6. ASTM F467—Standard Specification for Nonferrous Nuts for General Use.

C. American Water Works Association (AWWA)

1. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
2. AWWA C207—Steel Pipe Flanges for Waterworks Service, Sizes 4-Inch through 144-Inch (100 mm through 3,600 mm).

D. Manufacturers Standardization Society of the Valve and Fittings Industry (MSS)

1. MSS SP-58—Pipe Hangars and Supports – Material, Design, and Manufacture, Selection, Application, and Installation.

E. NSF International (NSF)

1. NSF 61/600—Drinking Water System Components – Health Effects.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. The Contractor shall protect the pipe from kinks, cuts, end damage, and other defects when transporting all piping. Binding and tie-down methods shall not

damage or deflect the pipes in any way. Pipe damaged during shipment shall be rejected.

C. Pipe shall be stored on level ground, preferably turf or sand, free of sharp objects that could damage the pipe. Stacking of any pipe shall be limited to a height that will not cause excessive deformation of the lower layers of pipe under anticipated temperature conditions. When necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such widths to not allow deformation of the pipe at the point of contact with the sleeper or between supports. Pipe shall not be removed from storage until bedding or sub-grade work is complete and ready to receive the pipe.

D. The joined pipe shall be handled in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. Ropes, fabric, or rubber-protected slings and straps shall be used when handling pipe. Chains, cables, or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe. Pipe or fittings shall not be dropped. Slings for handling joined pipe shall not be positioned at socket-welded joints. Sections of the pipes with cuts and gouges shall be removed and the ends of the pipe rejoined. In accordance with the pipe manufacturer's written instructions, the Contractor shall repair all pipe with damaged linings and pipe exterior coatings that have been damaged before the pipe is installed.

E. The Contractor shall cover all pipe stored on the site with canvas or other opaque material to protect it from sunlight. Provide air circulation under the covering.

F. The Contractor shall inspect all pipe, fittings, and other accessories upon delivery and during the work. Any defective or damaged materials found during field inspection or during tests shall be removed from the site and replaced by, and at the expense of, the Contractor.

G. The interior of all pipe, fittings, and other accessories shall be kept free from dirt and foreign matter at all times. Fittings shall be drained and stored in a manner that will protect them from damage by freezing.

H. Gaskets shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-delivered-to-site and first-to-be-installed rotation basis. Mechanical-joint glands, bolts, and washers shall be handled and stored in a manner that will ensure proper use with respect to types and sizes.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

1.07 DEFINITIONS OF BURIED, EXPOSED, AND SUBMERGED PIPING

A. Buried piping is piping buried in soil, beneath a structure and/or encased in concrete. Where an exterior pipe coating is specified to be factory- or field-applied, the Contractor shall provide the coating up to the penetration of a structure. Piping encased in concrete does not require an exterior coating other than what is factory furnished.

B. Exposed piping is piping in any of the following conditions or locations:

1. Above ground.
2. Inside buildings, vaults, or other structures.
3. In underground concrete trenches or galleries.

C. Submerged piping is considered to be all piping within a liquid holding tank.

1.08 SYSTEM DESIGN REQUIREMENTS

A. General

1. The Specifications and Drawings are not all inclusive of explicit piping details; provide piping for intended use in compliance with laws and regulations, including ASME B31.1 Code (Power Piping).
2. Pressure ratings and materials specified represent minimum acceptable standards for piping systems.
3. Piping Systems: Suitable for the services specified and intended.
4. Piping shall be color coded in accordance with the Department of Environmental Protection requirements.

B. Support Systems

1. The absence of pipe supports and details on the Drawings shall not relieve the Contractor of responsibility for sizing and providing supports for this project.

2. Select and design within the specified spans and component requirements.

3. Comply with requirements of MSS SP-58.

4. Criteria for structural design and selection of pipe support system components:

    a. Dead loads imposed by the weight of the pipes filled with water, within specified spans and component requirements, plus any insulation.
    b. Safety factor: Minimum of 5.

5. Design, size, and space support anchoring devices, including anchor bolts, inserts, and other devices used to anchor the support, to withstand the shear and pullout loads imposed by loading and spacing on each particular support.

    a. Piping smaller than 30 inches: Supports are shown only where specific types and locations are required; additional pipe supports may be required and are to be provided and installed by the Contractor at no additional cost to the Owner.

C. Adapters

1. No attempt has been made to show all adapters, spool pieces, reducers, bushings, or other fittings required to accommodate the connection of pipes, fittings, and valves of various joint design and sizes throughout the project. The Contractor is completely responsible for providing, at his expense, all adapters, reducers, sleeves, spool pieces, and other fittings and appurtenances necessary for connection of pipe (for the same pipe material of or a transition of pipe materials), valves, fittings, and appurtenances throughout the project, which shall be constructed of appropriate materials, coated and lined to match the materials, coatings, and linings specified for the connected components. All adapters, reducers, sleeves, spool pieces, and other fittings shall be coated and lined in accordance with the specifications for each individual pipe system.

D. Unions

1. No attempt has been made to show all unions required for the project. The Contractor shall provide unions at all connections of threaded pipe to installed equipment unless deleted by the Engineer, in writing, at certain locations. The unions shall meet or exceed the quality of materials, pressure rating, service, and painting requirements of connected piping.

PART 2 PRODUCTS

2.01 PIPING SYSTEM GENERAL REQUIREMENTS SCHEDULE

A. Unless noted otherwise in the Drawings, piping system materials, fittings, and appurtenances are subject to requirements of the individual Specifications for the piping systems.

2.02 PIPING SCHEDULE

A. A piping schedule (flow stream identification) listing the piping identification abbreviations, piping materials, operating pressures, field test pressures, lining systems, and color coding associated with the flow streams is provided on the Contract Drawings. In project locations where the piping system material referenced on the piping schedule is not appropriate, the required piping material is indicated on the Contract Drawings. Materials called out in the Contract Drawings shall govern over materials stated in the piping schedule.

2.03 THREAD FORMING FOR STAINLESS STEEL BOLTS

A. Form threads for stainless steel bolts by rolling, not by cutting or grinding.

2.04 BOLTS AND NUTS FOR FLANGES FOR DUCTILE IRON PIPE FLANGES

A. Bolts, washers, and nuts for pipe installed indoors, outdoors above and below ground, and in vaults and structures shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.

B. Bolts, washers, and nuts for submerged Class 150 flanges shall be Type 304 stainless steel conforming to ASTM A193/A193M (Grade B8) for bolts and ASTM A194/A194M (Grade 8) for nuts. Fit shall be Class 2A conforming to ASME B1.1 when connecting to cast-iron valves having body bolt holes.

2.05 BOLTS AND NUTS FOR TYPE 304 STAINLESS STEEL PIPE FLANGES

A. Bolts, washers, and nuts for flanges shall be Type 304 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

2.06 BOLTS AND NUTS FOR TYPE 316 STAINLESS STEEL PIPE FLANGES

A. Bolts, washers, and nuts for flanges shall be Type 316 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

2.07 BOLTS AND NUTS FOR PVC, CPVC, AND PVDF PIPE FLANGES

A. Bolts for piping in sodium hypochlorite service shall be made of titanium, in accordance with ASTM F467, Grade Ti1, Ti2, or Ti7. Nuts and washers shall conform to ASTM F467 and shall be made of titanium.

B. Bolts, washers, and nuts in chemical service other than sodium hypochlorite shall be Type 304 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

C. Bolts, washers, and nuts for buried and submerged flanges and flanges located outdoors above ground or in vaults and structures shall be Type 304 stainless steel conforming to ASTM A193/A193M, Grade B8, for bolts and ASTM A194/A194M, Grade 8, for nuts.

D. The Contractor shall provide a washer under each nut and under each bolthead. Washers shall be of the same material as the nuts.

2.08 BOLTS AND NUTS FOR STEEL PIPE FLANGES

A. Bolts, washers, and nuts for Class 150 flanges (including AWWA C207, Class D) located indoors, outdoors above ground, in vaults, and in structures shall be carbon steel, ASTM A307, Grade B. Bolts, washers, and nuts for buried service shall also be hot-dipped galvanized.

B. Bolts, washers, and nuts for submerged Class 150 flanges shall be Type 304 stainless steel conforming to ASTM A193/A193M (Grade B8) for bolts and ASTM A194/A194M (Grade 8) for nuts. Fit shall be Class 2A in accordance with ASME B1.1 when connecting to cast-iron valves having body bolt holes.

2.09 LUBRICANT FOR STAINLESS STEEL BOLTS AND NUTS

A. Anti-seize thread lubricant shall be applied to the thread portion of all (above grade and below grade) stainless steel bolts (stainless steel tie rods, etc.) during assembly. Anti-seize lubricant shall be chloride free and shall be nongalling NSF approved. Anti-seize thread lubricant shall be Jet-Lube “Nikal,” John Crane “Thred Gard Nickel,” Never-Seez “Pure Nickel Special,” or Permatex “Nickel Anti-Seize.”

2.10 FLANGE GASKETS FOR STEEL, DUCTILE IRON, AND STAINLESS STEEL PIPE

A. Flange gaskets shall be in accordance with AWWA C207, except as modified in this Section. Gaskets shall be ring type. All gasket material shall be suitable for

the fluid being conveyed and shall be resistant to free chlorine concentrations up to 10 mg/L. All gasket material shall be rated to the surge pressures listed in the pipe schedule. Gaskets shall be EPDM, Viton, or an approved equal.

2.11 FLANGE GASKETS FOR DUCTILE-IRON PIPE AND FITTINGS IN RAW SEWAGE

A. Gaskets shall be full face, 1/8 inch thick, Buna-N having a Brinell Hardness of 55 to 65 durometer. Gaskets shall be suitable for a water pressure of 200 psi at a temperature of 250°F. Gaskets shall have "nominal" pipe size inside diameters, not the inside diameters indicated in ASME B16.21. Provide Garlock Style 9122 or equal. The Contractor shall verify that the gaskets are compatible with all chemicals being used.

2.12 FLANGE GASKETS FOR PVC AND CPVC PIPE

A. Gaskets for flanged joints shall be full faced, 1/8 inch thick, having a Brinell Hardness of 50 to 70 durometer A. Gasket material shall be EPR unless noted or specified otherwise. Gasket material for sodium hypochlorite service shall be Viton ETP unless noted or specified otherwise. Gaskets shall be compatible with the fluids conveyed.

2.13 FLANGE GASKETS FOR PVDF PIPE

A. Gaskets for flanged joints shall be full faced, 5/64 inch thick (minimum), made of Teflon-bonded EPDM or PVDF-bonded EPDM. The EPDM shall have a Brinell Hardness of 65 to 70 Durometer “A.” Gaskets shall be suitable for a fluid temperature range of -40˚F to +210˚F and compatible with the fluids conveyed.

2.14 FLANGE GASKETS FOR STAINLESS STEEL PIPE IN CHEMICAL SERVICE

A. Gaskets shall be suitable for a maximum pressure of 300 psi and a maximum temperature of 500°F. The Contractor shall verify that the gaskets are compatible with the fluids conveyed. Gaskets for chemical service shall be one of the following materials:

1. Teflon-envelope type, full face, 1/8 inch thick, with compressed nonasbestos filler. Provide free-flow design in which the Teflon is machined or milled between leaves to provide a space for the filler.
2. Teflon (PTFE) with inert filler, 1/8 inch thick. Product: Garlock "Gylon 3510" shall be used for potassium hydroxide, sodium hypochlorite, and ammonium hydroxide. Garlock “Gylon 3545” shall be used for sulfuric acid, corrosion inhibitor, and hydrofluosilicic acid.

2.15 POTABLE WATER PIPING SYSTEMS

A. All potable water piping systems including pipe, valves, fittings, weld-solvents, linings, gaskets, lubricants, grout disinfection agents, and surfaces in contact with potable water shall meet all local and State of Florida regulations and requirements including NSF 61/600. The Contractor shall coordinate the color of the potable water system piping color with the Owner's color standard and shall provide color as approved by the Owner.

2.16 LOCATOR WIRE (OR DETECTABLE PIPELINE MARKING TAPE)

A. All 2-inch and larger buried piping shall be laid with two insulated, 12-gauge minimum AWG, THWN strand copper wires taped with adhesive-backed tape or tied to the nonmetallic pipe at 5 feet on center for location purposes.

PART 3 EXECUTION

3.01 PREPARATION

A. Field Alignment

1. The piping shown on the Contract Drawings is generally indicative of the work, with symbols and notations provided for clarity. However, the Contract Drawings are not an exact representation of all conditions involved; therefore, install piping to suit actual field conditions and measurements as approved by the Engineer. No extra compensation will be made for work due to differences between indicated and actual dimensions.
2. The Contractor shall install all adapters, fittings, flanged connections, closures, restrained joints, etc. not specified but necessary for a complete installation acceptable to the Engineer.
3. The Contract Drawings do not indicate all adapters, fittings, spool pieces, bushings, unions, supports, hangers, and other items required to accommodate the installing and connecting of pipe, fittings, valves, and equipment of various joint designs and sizes. Provide such required items of appropriate designs, materials, coatings, and linings.
4. An extensive network of underground piping, duct, conduit, direct-buried conductors, and related structures of various sizes, materials, alignments, age, and function exist within the project site. Conclusive information concerning these facilities is not available. Consequently, the design of new piping indicated on the Contract Drawings is approximate. Adjust alignment, fitting, valve, and joint locations as required and as approved by the Engineer to accommodate and protect existing facilities and provide the intended functionality of new piping.

3.02 FIELD LAYOUT AND MODIFICATIONS

A. Unless directed otherwise, the Contractor shall be responsible for setting construction layout stakes and/or offsets required to complete the designated work. The Contractor shall ensure that those stakes and/or offsets are protected and any re-staking required for any reason including work stoppage shall be included in the bid price and no additional compensation to the Contractor will be made.

B. The Engineer has the right to make any modifications the Engineer deems necessary due to field conditions, conflicts with other utilities, or to protect other properties.

3.03 PIPE PRODUCTS INSPECTION

A. The Contractor shall obtain from the pipe manufacturer a certificate of inspection to the effect that the pipe, fittings, gaskets, glands, bolts, and nuts supplied for this Contract have been inspected at the plant and that they meet the requirements of these Specifications. The Contractor shall submit these certificates to the Engineer before installing the pipe materials. The Contractor shall visually inspect all pipe and fittings at delivery and before they are lowered into the trench to be installed. Pipe or fittings that do not conform to these Specifications or have been damaged in any manner will be rejected and the Contractor must remove them immediately. The entire product of any plant may be rejected when, in the opinion of the Engineer, the methods or quality assurance and uniformity of manufacturer fail to secure acceptable and uniform pipe products or where the materials used produce inferior pipe products.

3.04 REMOVAL OF EXISTING PIPE AND FITTINGS

A. Pipe specifically identified on the Drawings to be removed or replaced from service shall be physically taken out of the ground. The limits of pipe to be removed shall be specifically called for in the plans or shall be approved in writing by the Engineer. Any other removal not specifically called for shall be approved in writing and shall be considered incidental to construction of other items in the contract and the Contractor will not receive compensation for such work.

B. When removing pipe the Contractor shall excavate a trench wide enough to dislodge the pipe from the surrounding soil and long enough to be able to handle the pipe without causing any damage to nearby utilities, structures, or adjacent property.

C. The removed pipe, fitting, and appurtenances will become the Contractor's property and the Contractor shall be responsible for proper disposal and any required permits for disposal.

D. Regarding pipe remaining in the ground subsequent to removal of connected pipe or pipe fittings, the remaining buried pipes, openings, and fittings shall be plugged or capped as approved by the Engineer.

E. Pipe that will be abandoned in place shall be plugged or capped as approved by the Engineer.

3.05 BURIED PIPING AND PIPE FITTINGS

A. Trenching and backfilling for all pipe and fittings shall also be in accordance with Section 02305, Earthwork for Utilities.

B. Installation

1. Inspect all piping for defects and remove all lumps or excess coatings before installation. The inside of the mechanical joint and outside of plain-end pipe shall be cleaned before joining pipe. Caution shall be taken to prevent damage to the pipe during lowering into the trench. Remove all foreign matter that has entered the pipe during storage and installation. The Contractor shall cover the pipe ends during installation to prevent debris from entering the pipe. No debris, tools, clothing, or other material shall be placed in the pipe.
2. After being placed in the trench, the pipe shall be brought to the proper line and grade by compacting the approved backfill material under it, except at the bell end. Joint deflection shall not exceed 75% of the manufacturer's limit.
3. The Contractor shall install temporary water-tight plugs on the pipe ends during the time that the pipe is in the trench but no work is in progress. If there is water in the trench upon beginning work, this plug shall remain in place until the trench has been pumped dry, unless otherwise approved by the Engineer, the Engineer’s Representative, or the Owner’s Representative.
4. Buried carbon steel bolts and nuts shall be coated in accordance with the manufacturer’s recommendations.
5. Coat threaded portions of stainless steel bolts and nuts with lubricant before assembly.
6. Restrained plugs or caps shall be inserted into all buried dead end pipes, tees, or crosses. Provide blind flanges for all flanged exposed piping. Restrained plugs and caps installed for pressure testing shall be fully secured and blocked to withstand the test pressure.

7. Where plugging is required because of contract division or phasing for later connection, the ends of such lines shall be equipped with a suitable cast-iron or ductile-iron plug/cap or blind flange with or without a blowoff cock, as shown on the Drawings. Installation or removal of such plugging shall be considered incidental to the work and the Contractor shall not be compensated by the Owner for performing this work.

3.06 FLANGED JOINTS FOR EXPOSED PIPE AND FITTINGS

A. When bolting flanged joints, the Contractor shall avoid restraint on the opposite end of the pipe or fitting, which would prevent uniform gasket compression or which would cause unnecessary stress in the flanges. One flange shall be free to move in any direction while the flange bolts are being tightened. Bolts shall be tightened gradually and at a uniform rate to ensure uniform compression of the gasket, in accordance with pipe and fitting manufacturer's recommendations.

B. Coat threaded portions of stainless steel bolts and nuts with lubricant before assembly.

3.07 PIPING CONNECTIONS TO PUMPS AND OTHER EQUIPMENT

A. When connecting to pumps and equipment, the Contractor shall ensure that piping stresses are not transmitted to the pump and equipment. All connecting pipe shall be permanently supported and aligned so that accurate matching of bolt holes and uniform contact over the entire surface of pump flanges are obtained before any bolts are installed in the flanges or pipe is threaded into pump and equipment. In addition, pump connection piping shall be free to move parallel to its longitudinal center line while the bolts are being tightened.

1. Pumps and equipment shall be leveled, aligned, and wedged into a position that will fit the connecting pipe, but shall not be grouted until the initial fitting and alignment of the pump and equipment may be shifted on its foundation if necessary to properly install the connecting pipe. Each pump and piece of equipment shall, however, be grouted before final bolting of the connecting piping.
2. After final alignment and bolting, the pump and equipment connections shall be tested for applied piping stresses by loosening the flange bolts which, if the piping is properly installed, should result in no movement of the piping relative to the pump or opening of the pump connection joints. If any movement is observed, the piping shall be loosened and re-aligned as required and then the flanges bolted back together. The flange bolts then shall be loosened and the process repeated until no movement is observed.

3. All carbon steel bolts and nuts shall be coated with the same exterior coating applied to the piping system.

3.08 ANCHORING AND RESTRAINING

A. Thrust blocks shall be used in new lines and shall be limited to areas in which a new fitting has been installed in an existing line and field restraining joints are not feasible or when directed by the Engineer.

3.09 FLUSHING, CLEANING, TESTING, AND INSPECTION OF PIPING

A. See Section 15144, Pressure Testing of Piping, for the requirements of pipe flushing, cleaning, pressure testing, and inspection requirements.

3.10 DISINFECTION

A. See Section 15141, Disinfection of Piping and Water Storage Facilities, for the disinfection requirements.

3.11 SPECIAL REQUIREMENTS AND PIPING SPECIALTIES

A. Welding

1. Use only certified welders meeting procedures and performance outlined in Section IX of the ASME BPVC and other codes and requirements in accordance with local building and utility requirements. Submit Welder's certificates to the Engineer for the project record before beginning any welding on the project. The Welder must be certified for all positions (flat, vertical, and overhead).
2. Have all welds conform to highest industrial practice in accordance with ASME B31.1 and ASME B31.3 or other codes and requirements in accordance with local building and utility requirements.

3.12 PIPE COLOR CODING

A. The pipe color shall be as identified on the Drawings. The Contractor shall coordinate with the Engineer and the Owner to generate a list of acceptable pipe colors for exposed piping systems. On applicable pipes, the color shall be in accordance with FDEP color-coding requirements.

END OF SECTION

SECTION 15075
PROCESS EQUIPMENT, PIPING, AND VALVE IDENTIFICATION

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section includes requirements for materials and installation of markers, labels, and signs for pipes, and valves; for mechanical equipment; for hazardous materials warnings.

1.02 SUBMITTALS

A. The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance.

B. The Contractor shall submit manufacturer's catalog data and descriptive literature describing materials, colors, letter size, and size of labels.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in the Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American National Standards Institute (ANSI)

1. ANSI Z535.1—Safety Colors.

B. American Society of Mechanical Engineers (ASME)

1. ASME A31.1—Scheme for Identification of Piping Systems.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 LABELS FOR PIPING

A. Labels for piping shall bear the full piping system name as shown in the Piping Schedule on the Drawings. The Contractor shall provide separate flow directional arrows next to each label. Color, size, and labeling shall conform to ASME A13.1 and ANSI Z535.1. Labels for piping inside buildings shall be vinyl cloth: W.H. Brady Co. B-500 vinyl cloth, Seton Name Plate Corporation Pipe Markers, or equal. Labels for piping located outdoors shall be weather- and UV-resistant acrylic plastic and shall be W. H. Brady Co. B-946, Seton Name Plate Corporation Pipe Markers, or equal.

B. Alternatively, the Contractor shall provide preprinted, semirigid, snap-on, color-coded pipe markers. Color, size, and labeling shall conform to ASME A13.1 and ANSI Z535.1. Label shall cover 360º (minimum). Labels shall be fabricated of weather- and UV-resistant acrylic plastic. Labels shall be Seton Nameplate Corporation SetMark pipe marks or equal.

2.02 LABELS FOR VALVES

A. The Contractor shall provide each valve listed on the Tag Number list with an identification tag. The tag shall be 2-inch-square or circular aluminum or 1/16-inch-thick fiberglass: W. H. Brady B-60, Seton Name Plate Corp. Series SVT, or equal. Aluminum tags shall have black-filled letters. The tag shall show the valve name.

2.03 HOSE BIBB SIGNS—UNSAFE WATER

A. The Contractor shall provide a rigid sign labeled "DANGER--UNSAFE WATER" for each hose bibb. Size and lettering shall conform to OSHA requirements. Signs shall be Seton Nameplate Company 20-gauge baked enamel, minimum size 7 inches by 3 inches; Brady B-120 Fiber-Shield fiberglass, minimum size 7 inches by 3 inches, 1/8 inch thick; or equal.

2.04 LABELS FOR MECHANICAL EQUIPMENT

A. The Contractor shall provide a label for each pump or other piece of mechanical equipment. The label shall show the equipment name and tag number as shown on

the Tag Number list or on the Drawings. Labels shall be 1-1/2 inches (minimum) by 4 inches (minimum) brass, aluminum, or 1/8-inch-thick fiberglass tags.

2.05 UNDERGROUND PLASTIC WARNING TAPE FOR PIPE

A. The Contractor shall provide permanent, bright-colored, continuous-printed plastic tape intended for direct burial service, not less than 6 inches wide by 3.5 mils thick. Provide tape with printing that most accurately indicates the type of service of buried pipe. Provide the following colored tape for the various piping services:

Service	Color
Cable TV	Orange
Gas	Yellow
Electric	Red
Telephone	Orange
Water	Blue
Sewer	Green
Chemical	Yellow
Reclaimed Water	Violet

2.06 UNDERGROUND DETECTABLE METALLIC PIPE WARNING TAPE

A. The Contractor shall provide permanent, bright-colored, continuous-printed tape consisting of an aluminum or steel foil sheathed in a plastic laminate, not less than 3 inches wide by 5 mils thick. Provide tape with printing that most accurately indicates the type of buried service. Provide the following colored tape for the various piping services:

Service	Color
Cable TV	Orange
Gas	Yellow
Electric	Red
Telephone	Orange
Water	Blue
Sewer	Green
Chemical	Yellow
Reclaimed Water	Violet

PART 3 EXECUTION

3.01 INSTALLING PIPE LABELS

A. The Contractor shall provide a label and flow arrow at each connection to pumps or other mechanical equipment, at wall boundaries, at tees and crosses, and at 20-foot centers on straight runs of piping.

B. On piping having external diameters less than 6 inches (including insulation, if any), the Contractor shall provide full-band pipe markers, extending 360º around pipe at each location.

C. On piping having external diameters of 6 inches and larger (including insulation, if any), provide either full-band or strip-type pipe markers but not narrower than three times letter height (and of required length), fastened by one of the following methods:

1. Laminated or bonded application of pipe marker to pipe or insulation.
2. Strapped-to-pipe or insulation application of semirigid type with Type 304 or 305 stainless steel bands.

3.02 INSTALLING VALVE AND EQUIPMENT LABELS

A. The Contractor shall attach labels to the valve or piece of equipment with Type 304 or 316 stainless steel chains unless otherwise noted.

B. The Contractor shall attach valve labels to the valve handwheels. If the valve has no handwheel, attach the label to the valve by tying the tag wire or chain around the operating shaft or nut.

3.03 INSTALLING MISCELLANEOUS SIGNS

A. The Contractor shall attach miscellaneous signs according to the sign manufacturer's recommendations and in accordance with OSHA requirements.

3.04 INSTALLING UNDERGROUND PLASTIC WARNING TAPE FOR PIPE

A. During backfilling of each exterior underground piping system, the Contractor shall install continuous underground-type plastic line marker directly over buried line at 6 to 8 inches above the top of the pipe. Where multiple small lines are buried in a common trench and do not exceed an overall width of 16 inches, install a single line marker.

3.05 INSTALLING UNDERGROUND DETECTABLE METALLIC PIPE WARNING TAPE

A. The Contractor shall install tape 4 to 6 inches below finished ground surface directly over buried pipelines. Where multiple small pipelines are buried in a common trench and do not exceed an overall width of 16 inches, install a single marker tape.

END OF SECTION

SECTION 15110
MANUAL, CHECK, AND PROCESS VALVES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all valves as shown in the Drawings and as specified in this Section. All valves shall be complete with all necessary manual actuators, valve boxes, extension stems, and floor stands, which are required for proper valve operation and completion of the work.

1. All valves shall be of the sizes shown in the Drawings. All equipment of the same type shall be from one manufacturer, unless authorized in writing by the Engineer.

2. The valves shall include but not be limited to the following:

a. Air valves.
b. Ball valves.
c. Gate valves.
d. Plug valves.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product technical submittal data shall contain the following information and data:

1. Acknowledgment that products submitted meet requirements of standards referenced.

2. Manufacturer’s installation instructions.

3. Manufacturer’s operation and maintenance manuals.

4. Data of valves, actuators, and accessories:

a. Pressure and temperature rating.
b. Materials of construction, with ASTM reference and grade.
c. Linings and coatings.

d. Dimensions and weight.
e. Flow coefficient.
f. Actuators and accessories details.
g. Manufacturer's product brochure, cut-sheets, and parts diagrams.

B. Dimensions and orientation of valve actuators as installed on the valves. Show location of internal stops for gear actuators. State differential pressure and fluid velocity used to size actuators. For worm-gear actuators, state the radius of the gear sector in contact with the worm and state the handwheel diameter.

C. The following test reports: Performance Tests; Leakage Tests; Hydrostatic Tests; and Proof-of-Design Tests as applicable or required.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Petroleum Institute (API)

1. API SPEC 6D—Specification for Valves.
2. API STD 6FA—Standard for Fire Test for Valves.
3. API STD 594—Check Valves: Flanged, Lug, Wafer, and Butt-Welding.
4. API STD 607—Fire Test for Quarter-Turn Valves and Valves Equipped with Nonmetallic Seats.

B. American Society for Testing of Materials (ASTM)

1. ASTM A36/A36M—Standard Specification for Carbon Structural Steel.
2. ASTM A47/A47M—Standard Specification for Ferritic Malleable Iron Castings.
3. ASTM A48/A48M—Standard Specification for Gray Iron Castings.
4. ASTM A105/A105M—Standard Specification for Carbon Steel Forgings for Piping Applications.
5. ASTM A108—Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
6. ASTM A126—Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
7. ASTM A148/A148M—Standard Specification for Steel Castings, High Strength, for Structural Purposes.
8. ASTM A181/A181M—Standard Specification for Carbon Steel Forgings, for General-Purpose Piping.

9. ASTM A182/A182M—Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.
10. ASTM A193/A193M—Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High Temperature or High Pressure Service and Other Special Purpose Applications.
11. ASTM A194/A194M—Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
12. ASTM A216/A216M—Standard Specification for Steel Castings, Carbon, Suitable for Fusion-Welding, for High-Temperature Service.
13. ASTM A240/A240M—Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
14. ASTM A269/A269M—Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
15. ASTM A276/A276M—Standard Specification for Stainless Steel Bars and Shapes.
16. ASTM A313/A313M—Standard Specification for Stainless Steel Spring Wire.
17. ASTM A322—Standard Specification for Steel Bars, Alloy, Standard Grades.
18. ASTM A351/A351M—Standard Specification for Castings, Austenitic, for Pressure-Containing Parts.
19. ASTM A395/A395M—Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures.
20. ASTM A436—Standard Specification for Austenitic Gray Iron Castings.
21. ASTM A439/A439M—Standard Specification for Austenitic Ductile Iron Castings.
22. ASTM A449—Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use.
23. ASTM A479/A479M—Standard Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels.
24. ASTM A494/A494M—Standard Specification for Castings, Nickel and Nickel Alloy.
25. ASTM A516/A516M—Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service.
26. ASTM A536—Standard Specification for Ductile Iron Castings.
27. ASTM A564/A564M—Standard Specification for Hot-Rolled and Cold-Finished Age-Hardening Stainless Steel Bars and Shapes.
28. ASTM A582/A582M—Standard Specification for Free-Machining Stainless Steel Bars.

29. ASTM A666—Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
30. ASTM A743/A743M—Standard Specification for Castings, Iron-Chromium, Iron-Chromium-Nickel, Corrosion Resistant, for General Application.
31. ASTM A744/A744M—Standard Specification for Castings, Iron-Chromium-Nickel, Corrosion Resistant, for Severe Service.
32. ASTM A890/A890M—Standard Specification for Castings, Iron-Chromium-Nickel-Molybdenum Corrosion-Resistant, Duplex (Austenitic/Ferritic) for General Application.
33. ASTM B16/B16M—Standard Specification for Free-Cutting Brass Rod, Bar, and Shapes for Use in Screw Machines.
34. ASTM B21/B21M—Standard Specification for Naval Brass Rod, Bar, and Shapes.
35. ASTM B61—Standard Specification for Steam or Valve Bronze Castings.
36. ASTM B62—Standard Specification for Composition Bronze or Ounce Metal Castings.
37. ASTM B98/B98M—Standard Specification for Copper-Silicon Alloy Rod, Bar, and Shapes.
38. ASTM B99/B99M—Standard Specification for Copper-Silicon Alloy Wire for General Applications.
39. ASTM B127—Standard Specification for Nickel-Copper Alloy Plate, Sheet, and Strip.
40. ASTM B148—Standard Specification for Aluminum-Bronze Sand Castings.
41. ASTM B150/B150M—Standard Specification for Aluminum Bronze Rod, Bar, and Shapes.
42. ASTM B164—Standard Specification for Nickel-Copper Alloy Rod, Bar, and Wire.
43. ASTM B169/B169M—Standard Specification for Aluminum Bronze Sheet, Strip, and Rolled Bar.
44. ASTM B193—Standard Test Method for Resistivity of Electrical Conductor Materials.
45. ASTM B371/B371M—Standard Specification for Copper-Zinc-Silicon Alloy Rod.
46. ASTM B427—Standard Specification for Gear Bronze Alloy Castings.
47. ASTM B443—Standard Specification for Nickel-Chromium-Molybdenum-Columbium Alloy and Nickel-Chromium-Molybdenum-Silicon Alloy Plate, Sheet, and Strip.
48. ASTM B446—Standard Specification for Nickel-Chromium-Molybdenum-Columbium Alloy (UNS N06625), Nickel-Chromium-Molybdenum-Silicon Alloy (UNS N06219), and Nickel-Chromium-Molybdenum-Tungsten Alloy (UNS N06650) Rod and Bar.

49. ASTM B462—Standard Specification for Forged or Rolled Nickel Alloy Pipe Flanges, Forged Fittings, and Valves and Parts for Corrosive High-Temperature Service.
50. ASTM B463—Standard Specification for UNS N08020 Alloy Plate, Sheet, and Strip.
51. ASTM B472—Standard Specification for Nickel Alloy Billets and Bars for Reforging.
52. ASTM B584—Standard Specification for Copper Alloy Sand Castings for General Applications.
53. ASTM B763/B763M—Standard Specification for Copper Alloy Sand Castings for Valve Applications.
54. ASTM D1248—Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable.
55. ASTM D1784—Standard Classification System and Basis for Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
56. ASTM D1785—Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
57. ASTM D2000—Standard Classification System for Rubber Products in Automotive Applications.
58. ASTM D3222—Standard Specification for Unmodified Poly (Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials.
59. ASTM D4101—Standard Classification System and Basis for Specification for Polypropylene Injection and Extrusion Materials.
60. ASTM F441/F441M—Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.
61. ASTM F467—Standard Specification for Non-ferrous Nuts for General Use.
62. ASTM F468—Standard Specification for Non-ferrous Bolts, Hex Cap Screws, Socket Head Cap Screws, and Studs for General Use.

C. American Society of Mechanical Engineers (ASME)

1. ASME B1.20.1—Pipe Threads, General Purpose (Inch).
2. ASME B1.20.7—Hose Coupling Screw Threads (Inch).
3. ASME B16.1—Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250.
4. ASME B16.5—Pipe Flanges and Flanged Fittings NPS 1/2 through NPS 24 Metric/Inch Standard.
5. ASME B16.10—Face-to-Face and End-to-End Dimensions of Valves.
6. ASME B16.11—Forged Fittings, Socket-Welding and Threaded.
7. ASME B16.18—Cast Copper Alloy Solder Joint Pressure Fittings.
8. ASME B16.24—Cast Copper Alloy Pipe Flanges, Flanged Fittings, and Valve Classes 150, 300, 600, 900, 1500, and 2500.

9. ASME B16.34—Valves – Flanged, Threaded, and Welding End.
10. ASME B16.42—Ductile Iron Pipe Flanges and Flanged Fittings Classes 150 and 300.
11. ASME B16.47—Large Diameter Steel Flanges NPS 26 through NPS 60 Metric/Inch Standard.
12. ASME B36.10M—Welded and Seamless Wrought Steel Pipe.

D. American Society of Safety Engineers (ASSE)

1. ASSE 1011—Performance Requirements for Hose Connection Vacuum Breakers.

E. American Water Works Association (AWWA)

1. AWWA C110/A21.10—Ductile-Iron and Gray-Iron Fittings.
2. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
3. AWWA C115/A21.15—Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
4. AWWA C207—Steel Pipe Flanges for Waterworks Service, Sizes 4-Inch through 144-Inch (100 mm through 3,600 mm).
5. AWWA C500—Metal-Seated Gate Valves for Water Supply Service.
6. AWWA C504—Rubber-Sealed Butterfly Valves.
7. AWWA C507—Ball Valves 6-Inch through 60-Inch (150 mm through 1,500 mm).
8. AWWA C508—Swing-Check Valves for Waterworks Service, 2-Inch through 48-Inch (50 mm through 1,200 mm) NPS.
9. AWWA C509—Resilient-Seated Gate Valves for Water Supply Service.
10. AWWA C512—Air Release, Air/Vacuum, and Combination Air Valves for Water and Wastewater Service.
11. AWWA C515—Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service.
12. AWWA C550—Protective Interior Coatings for Valves and Hydrants.
13. AWWA C606—Grooved and Shouldered Joints.
14. AWWA C800—Underground Service Line Valves and Fittings.

F. Fluid Controls Institute (FCI)

1. ANSI/FCI 70-2—Control Valve Seat Leakage.

G. Manufacturers Standardization Society (MSS)

1. MSS SP-61—Pressure Testing of Valves.
2. MSS SP-67—Butterfly Valves.

3. MSS SP-68—High Pressure Butterfly Valves with Offset Design.
4. MSS SP-81—Stainless-Steel or Stainless-Steel-Lined, Bonnetless, Knife Gate Valves with Flanged Ends.
5. MSS SP-83—Class 3000 Steel Pipe Unions Socket Welding and Threaded (Carbon Steel, Alloy Steel, Stainless Steel, and Nickel Alloy).
6. MSS SP-108—Resilient-Seated Cast Iron Eccentric Plug Valves.

H. National Association of Corrosion Engineers International (NACE)

1. NACE AMPP MR0103—Petroleum, Petrochemical, and Natural Gas Industries – Metallic Materials Resistant to Sulfide Stress Cracking in Corrosive Petroleum Refining Environments.
2. NACE AMPP MR0175/ISO15156—Petroleum and Natural Gas Industries – Materials for Use in H2S-Containing Environments in Oil and Gas Production.

I. National Fluid Power Association (NFPA)

1. NFPA T3.6.7—Fluid Power Systems and Products – Square Head Industrial Cylinders – Mounting Dimensions.
2. NFPA T3.6.68—Fluid Power – Square Head Cylinders – Determination of the Static Failure Pressure Rating of Pressure-Containing Components.

J. NSF International (NSF)

1. NSF 61/600—Drinking Water System Components – Health Effects.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. All valves, unless otherwise directed, shall be loaded and unloaded by lifting, and under no circumstances shall valves be dropped, skidded, or rolled. Valves shall not be stacked or placed under pipe, fittings, or other valves in such a manner that damage could result.

C. Slings, hooks, or tongs used for lifting shall be padded in such a manner as to prevent damage to exterior surface or interior linings and valve components. If any part of the coating, lining, or components is damaged, the repairs or replacement shall be made by the Contractor at his expense and in a manner satisfactory to the Engineer before attempting to install such valves.

D. Only new valves will be allowed for installation and shall be stored in a manner to prevent damage and be kept free of dirt, mud, or other debris.

1.06 QUALIFICATIONS

A. All of the valves shall be products of well-established firms which are fully experienced, reputable, have been selling this product for a minimum of 10 years, and are qualified in the manufacture of the particular product furnished. The valves shall be designed, constructed, and installed in accordance with the requirements and procedures of applicable AWWA standards and shall comply with these Specifications as applicable.

1.07 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

1.08 VALVE TYPE CLASSIFICATIONS

A. Air Valves (Type 100 series)

1. Type 125: Combination Air Valves for Water Services, Single Body.
2. Type 140: Air Valves for Sewage Services, Air Release.

B. Ball Valves (Type 200 series)

1. Type 221: Full-Port Threaded Stainless-Steel Ball Valves, 2 Inches and Smaller, for Water Service.
2. Type 231: Full-Port Threaded Carbon-Steel Ball Valves, 2 Inches and Smaller.

C. Gate Valves (Type 600 series)

1. Type 637: Ductile-Iron Resilient Wedge Tapping Gate Valves, 4 Inches through 16 Inches (AWWA C515).
2. Type 682: Cast-Iron Resilient Wedge Gate Valves, 3 Inches through 20 Inches, for Buried Service (AWWA C509).

D. Plug Valves (Type 900 series)

1. Type 920: Cast-Iron Non-Lubricated Eccentric Plug Valves, 4 Inches and Larger.

PART 2 PRODUCTS

2.01 GENERAL

A. Valves are identified in the Drawings by size and type number. For example, a callout of 36V300 refers to a 36-inch-diameter Type 300 valve. A Type 300 valve is a flanged, rubber-seated butterfly valve that is 4 inches through 72 inches for exposed service.

B. All valves shall be complete with all necessary geared actuators, chainwheels and chains, handwheels, levers, valve bonnets, valve boxes, extension stems, operating nuts, and T-handle wrenches, which are required for proper valve operating and completing of the work included under this Section. Renewable parts including discs, packing, and seats shall be of types specified in this Section and acceptable by valve manufacturer for the intended service. All units shall have the name of the manufacturer and the size of the valve cast on the body or bonnet or shown on a permanently attached stainless-steel plate in raised embossed letters. All isolation valves shall be suitable for the intended service with bubble-tight shutoff to flow in either direction.

C. Bronze or brass components in contact with water shall comply with the following requirements:

Constituent	Content
Zinc	7% maximum
Aluminum	2% maximum
Lead	8% maximum
Copper + Nickel + Silicon	83% minimum

D. Valves and valve operators shall be factory prepared and primed and field finish coated in accordance with Section 09900, Painting and Coating.

2.02 VALVE ACTUATORS

A. The valve actuator shall be an integral part of a valve. The valve actuator shall be provided, installed, and adjusted by the valve manufacturer. Actuator mounting arrangements shall facilitate operation and maintenance and shall be determined by the valve manufacturer unless indicated otherwise on the Drawings or directed by the Engineer.

B. All valves shall open counter clockwise as viewed from the top. Unless otherwise required by the Owner, the direction of rotation of the wheel or wrench nut to open each valve shall be to the left (counterclockwise). Each valve body or actuator shall have the word "Open" cast on it and an arrow indicating the direction to open.

C. Actuators shall clearly indicate valve position and an adjustable stop shall be provided to set closing torque. All exposed nuts, bolts, and washers shall be AISI Type 304 stainless steel. Unless noted otherwise, valves shall be equipped with the following manual actuators:

1. Exposed Valves 6 Inches and Smaller: removable lever or handwheel actuators.
2. Exposed Valves 8 Inches and Larger: geared actuators with handwheels.
3. Buried or Submerged Valves 6 Inches and Smaller: 2-inch-square operating nuts (with valve bonnets, valve boxes, and extension stems as required) and T-handle wrench.
4. Buried or Submerged Valves 8 Inches and Larger: Geared actuators with 2-inch-square operating nuts (with valve bonnets, valve boxes, and extension stems as required) and wrench.

D. Levers or handwheels shall be provided to actuate the valves where the valves are within 6 feet and 7 inches from finished grade or the operating floor. Handwheels shall be constructed of ductile-iron. Levers and handwheels shall be coated in accordance with Section 09900, Painting and Coating. Handwheel diameters for traveling nut actuators shall not exceed 8 inches for valves 12 inches and smaller and shall not exceed 12 inches for valves 20 inches and smaller.

E. Chainwheel and guide actuators shall be provided for all exposed valves installed with their centerlines more than 6 feet and 9 inches above finished grade. Chainwheels shall be cast-iron with stainless-steel stem, clip, and pins. The actuating chain shall be AISI Type 304 stainless steel. Stainless-steel chain baskets shall also be provided with these units. Chainwheels shall be coated in accordance with Section 09900, Painting and Coating. Chainwheels and guides shall be Clow Figure F-5680, DeZurik Series W or LWG, Stockham, or equal.

F. Gear actuators for valves 8 inches through 20 inches shall be of the worm-and-gear or of the traveling-nut type. Gear actuators for valves 24 inches and larger shall be of the worm-and-gear type. Gear actuators for motorized valves shall be of the worm-and-gear type, regardless of size.

1. Gear actuators should be designed assuming that the differential pressure across the valves is equal to the test pressure of the connecting piping and

assuming a line fluid temperature range of 33°F to 125°F, unless otherwise required in the detailed valve specifications.

2. Gear actuators shall be enclosed and oil lubricated with seals provided on shafts to prevent entry of dirt and water into the actuator. Gear actuators for valves aboveground or in vaults and structures shall have handwheels. The actuators for valves in exposed service shall contain a dial indicating the position of the valve disc or plug.
3. Traveling nut and worm-and-gear actuators shall be of the totally enclosed design and proportioned to permit operation of the valve under full differential pressure rating of the valve with a maximum pull of 80 pounds on the handwheel or crank. Stop-limiting devices shall be provided in the actuators in the open and closed positions. Actuators shall be of the self-locking type to prevent the disc or plug from creeping. Design actuator components between the input and the stop-limiting devices to withstand without damage a pull of 200 pounds for handwheel or chainwheel actuators and an input torque of 300 foot-pounds for operating nuts when operating against the stops.
4. The self-locking worm gear shall be a one-piece design of gear bronze material (ASTM B427; or ASTM B584, Alloy C86200) that is accurately machine cut. Actuators for eccentric and lubricated plug valves may use ductile-iron gears provided the gearing is totally enclosed with spring-loaded rubber lip seals on the shafts. The worm shall be hardened alloy steel (ASTM A322, Grade G41500 or G41400; or ASTM A148/A148M, Grade 105-85) with thread ground and polished. Support worm-gear shafts at each end by ball or tapered roller bearings. The reduction gearing shall run in a proper lubricant. The handwheel diameter shall be no more than twice the radius of the gear sector in contact with the worm. Worm-gear actuators shall be Limitorque Model HBC, EIM Series W, or equal.

G. For buried or submerged service, provide watertight shaft seals and watertight valve and actuator cover gaskets. Provide totally enclosed actuators designed for buried or submerged service.

H. All buried valves shall have non-rising stems. All buried valves 3 feet below grade or deeper as measured at the valve centerline shall be furnished with an operator stem extension to extend the operating nut within 6 inches from the top of the valve box cover.

2.03 VALVE END CONNECTIONS

A. Provide valve end connections conforming to connected piping and as shown in the Drawings. Generally, all buried valves shall be mechanical joint type end connectors. Exposed valves shall be screwed-end, socket-weld end, or flanged to conform to adjacent exposed connected piping system.

B. Comply with the following standards:

1. Threaded: ASME B1.20.1.
2. Flanged: ASME B16.1 Class 125 unless other noted or AWWA C207.
3. Mechanical (gland) Type: AWWA C111/A21.11.
4. Soldered: ASME B16.18.

C. Nuts, Bolts, and Washers: Wetted or internal to be bronze or stainless-steel. Exposed to be zinc or cadmium-plated.

D. Epoxy Interior Coating: Provide epoxy coating for all interiors of ferrous valve body surfaces in accordance with AWWA C550. Coatings shall be NSF-approved for valves in all potable water piping services. Coatings shall not be required for stainless-steel valve interiors.

2.04 VALVE BOXES

A. All buried valves 2-inch size and larger shall be equipped with a standard cast-iron roadway valve box. Valve boxes shall be of the slip or sliding type with a round lid marked "Water" for potable water valves or “Sewer” for wastewater and a square lid marked “Reclaimed Water” for reclaimed water valves. The box shall be designed to prevent transfer of the surface loads directly to the valve or piping. Valve boxes must have a minimum adjustable range of 12 inches and a minimum inner diameter of 6 inches. All valve boxes and lids shall be produced from grey cast-iron conforming to the latest revision of specification for grey iron castings, ASTM A48/A48M, Class 20A-25A. All castings shall be true and free of holes and shall be cleaned according to good foundry practice, chipped and ground as needed to remove fins and rough places on castings. Valve boxes have to be rated to sustain FDOT H-20 loadings and have a minimum depth of 8 inches. The valve box lid shall fit flush in the top of the box without forcing and shall not rock, tip, or rattle.

B. Provide debris cap as required in the Drawings.

C. Coat buried cast-iron pieces as specified in Section 09900, Painting and Coating, System No. 21 or with fusion-bonded epoxy.

D. Valve boxes shall be as manufactured by Tyler Pipe, Geneco, Star Pipe Products, or equal.

2.05 EXTENSION STEMS

A. Where the depth of the valve is such that its centerline is more than 4 feet below grade, provide operating extension stems to bring the operating nut to a point 6 inches below the surface of the ground and/or box cover. Where the valve is submerged, provide operating extension stems to bring the operating nut to 6 inches above the water surface. Extension stems shall be Type 316 stainless steel, solid core, and shall be complete with 2-inch-square operating nut. The connections of the extension stems to the operating nuts and to the valves shall withstand without damage a pull of 300 foot-pounds.

B. Extension stem diameters shall be as tabulated below:

Valve Size (inches)	Minimum Extension Stem Diameter (inches)
2	3/4
3, 4	7/8
6	1
8	1-1/8
10, 12	1-1/4
14	1-3/8
16, 18	1-1/2
20, 24, 30, 36	1-3/4
42, 48, 54	2

C. Provide buried valves or valves located inside manholes or vaults with valve boxes cast in the manhole or vault roof with a valve position indicator designed to fit standard 5-1/4-inch valve boxes. The indicators shall show valve position and the direction and number of turns required to fully open (or close). All internal gearing shall be sealed. Ship each unit ready for field installation complete with valve box cast-iron adapter, capscrews, guide bushing, position indicator, flexible washer, centering plate, and 2-inch AWWA nut. Valve box and indicator shall be provided by the valve manufacturer. Indicators shall be Westran Position Indicator, Pratt Diviner, or equal.

2.06 FLOOR STANDS

A. When required by the installations, provide floor stands for the operation of valves. Floor stands shall be of the nonrising stem, indicating type, complete with steel extension stems, couplings, handwheels, stem guide brackets, and special yoke attachments as required by the valves and recommended and supplied by the stand manufacturer. Floor stands shall be cast-iron base type: Clow, Figure F-5515; Bingham and Taylor; Stockham; or equal. Handwheels shall turn counterclockwise to open the valves.

B. Provide Type 316 stainless-steel anchor bolts.

C. Provide Type 316 stainless-steel extension stems for valves in exposed service. Provide Type 316 stainless-steel stems for valves in submerged service.

D. Provide adjustable stem guide brackets for extension stems. The bracket shall allow valve stems to be set over a range of 2 to 36 inches from walls. Provide bushings drilled to accept up to 2-inch-diameter stems. Base, arm, and clamp shall be Type 316 stainless-steel. Bushing shall be bronze (ASTM B584, Alloy C86400 or C83600). Bolts, nuts, screws, and washers (including wall anchor bolts) shall be Type 316 stainless steel. Provide slots in the bracket to accept 3/4-inch bolts for mounting the bracket to the wall. Products: Trumbull Industries, Inc., Adjustable Stem Guide or equal.

2.07 BOLTS, NUTS, AND GASKETS FOR FLANGED VALVES

A. Bolts, nuts, and gaskets for flanged valves shall be as described in Section 15055, Piping Systems—General.

2.08 PAINTING AND COATING

A. Coat buried metal valves at the place of manufacture as specified in Section 09900, Painting and Coating, System No. 21.

2.09 AIR VALVES (TYPE 100 SERIES)

A. General Description

1. All valves shall meet or exceed all applicable provisions of the latest revision of AWWA C512. All valves for drinking water services shall comply with NSF 61/600. Design pressure is 150 psig. Valves shall be operable for water temperatures of above freezing to 125°F.
2. All valves shall consist of a float or a float assembly. Valves shall be identified properly in plates attached permanently on the valve body. The body and cover shall be cast-iron ASTM A126, Class B, or ASTM A48/A48M, Class 35. Valves 3 inches and smaller shall have threaded ends. Valves 4 inches and larger shall have flanged ends. Threaded ends shall comply with ASME B1.20.1. Flanges shall comply with ASME B16.1, Class 125. All flanges shall be flat faced.
3. The float shall be Type 304 or 316 Stainless-Steel. For valves with inlet sizes less than 4 inches, the float shall be able to withstand a collapse pressure of 1,000 psig. For inlet sizes 4 inches and larger, the float shall be capable of withstanding collapse pressures of 750 psig. Trim shall be Type 304 or 316 Stainless-Steel. The valve seat shall be of EPDM or other

rubber materials applicable to wastewater and sludge. The valve seat shall be easily removed and replaced in the field.

4. Drain/test ports on all valves with inlet size 1 inch or larger shall have two 1/2-inch NPT minimum plugged ports, one near the bottom of the valve body and the other near the top of the valve. The plug shall be of bronze, ASTM B584, Alloy C83600.

B. Type 125—Combination Air Valves for Water Services, Single Body

1. Type 125 combination air valve for water service shall be 1-inch through 4-inch inlet size. It shall consist of an air and vacuum valve with an air-release valve in a single-body double-orifice arrangement. The valve body and cover shall be constructed of ASTM A126 Class B cast-iron. The body inlet shall be baffled with a Buna-N float cushion. The floats shall be 300 series stainless-steel. The seats shall be Buna-N and provide drop tight shut-off. Valves shall be APCO 140C Series, Val-Matic Model 201C – 204C, or equal.

C. Type 140—Air Valves for Sewage Services, Air Release

1. Type 140 air valves for sewage service shall be A.R.I. Model S-025, or equal.

2.10 BALL VALVES (TYPE 200 SERIES)

A. Type 221—Full-Port Threaded Stainless-Steel Ball Valves, 2 Inches and Smaller, for Water Service

1. Stainless-steel ball valves 2 inches and smaller for water service shall be rated at a minimum pressure of 1,000 psi WOG at a temperature of 100°F. Provide full-port ball and body design. Valve body, ball, and stem shall be Type 316 stainless-steel, ASTM A276/A276M or A351. Seat and seals shall be reinforced PTFE. Valves shall have lever actuators, plastic coated. Valves shall have screwed ends (ASME B1.20.1) and nonblowout stems. Valves shall be Worcester Series 59, Apollo 86A-100 Series, or approved equal.

B. Type 231—Full-Port Threaded Carbon-Steel Ball Valves, 2 Inches and Smaller

1. Carbon-steel ball valves 2 inches and smaller shall be rated at a minimum pressure of 1,000 psi WOG at a temperature of 100°F. Valve body shall be carbon-steel, ASTM A216/A216M, Grade WCB. Ball shall be Type 316 stainless-steel or carbon-steel, chrome, or nickel-plated. Seat and seals shall be reinforced PTFE. Valves shall have lever handle, plastic coated.

Valves shall have screwed ends (ASME B1.20.1) and nonblowout stems. Valves shall be Worcester Series 59, Apollo 83A-140 Series, or approved equal.

2.11 BUTTERFLY VALVES (TYPE 300 SERIES) (NOT USED)

2.12 CHECK VALVES (TYPE 400 SERIES) (NOT USED)

2.13 DIAPHRAGM VALVES (TYPE 500 SERIES) (NOT USED)

2.14 GATE VALVES (TYPE 600 SERIES)

A. Type 637—Ductile-Iron Resilient Wedge Tapping Gate Valves, 4 Inches through 16 Inches (AWWA C515)

1. Valves shall comply with AWWA C515 and the following. Valves shall be of the bolted bonnet type with nonrising stems. Valve stems shall be Type 304 or 316 stainless-steel or cast, forged, or rolled bronze. Stem nuts shall be made of solid bronze. Bronze for internal working parts, including stems, shall not contain more than 2% aluminum nor more than 7% zinc. Bronze shall conform to ASTM B62 or ASTM B584 (Alloy C83600), except that the stem bronze shall have a minimum tensile strength of 60,000 psi, a minimum yield strength of 30,000 psi, and a minimum of 10% elongation in 2 inches (ASTM B584 or B763/B763M, Alloy C87600 or C99500). Body bolts shall be Type 316 stainless-steel. Ends shall be flanged, Class 125, ASME B16.1. One end shall have slotted bolt holes in accordance with AWWA C515, Paragraph 4.4.1.3.4 to fit tapping machines.
2. Provide reduction-thrust bearings above the stem collar. Stuffing boxes shall be O-ring seal type with two rings located in the stem above the thrust collar. Each valve shall have a smooth unobstructed waterway free from any sediment pockets.
3. Valves shall be lined and coated at the place of manufacture with either fusion-bonded epoxy or heat-cured liquid epoxy. Minimum epoxy thickness shall be 8 mil.
4. Manufacturers: Clow, AVK, American Flow Control, Mueller, Waterous, Kennedy, or equal.

B. Type 682—Cast-Iron Resilient Wedge Gate Valves, 3 Inches through 20 Inches, for Buried Service (AWWA C509)

1. Valves 2 inches and larger for buried service operation shall be of cast-iron or ductile-iron body construction and conform to AWWA C509 for resilient seated gate valves. The valve design shall incorporate non-rising

stems and "O" ring stem seals. Valves shall open counterclockwise. Valves shall be designed for bubbletight shutoff to flow in either direction. Before shipment, the valve manufacturer shall test each valve to 200 psi pressure differential in both directions and provide a certificate to the Engineer stating that each valve provided bubbletight shutoff during testing. The valve interior shall be epoxy coated on the entire ferrous surface of the waterway. The valve exterior shall be coated in accordance with Section 09900, Painting and Coating, and encased with polyethylene as specified in this Section for ductile-iron pipe and fittings. Buried valves shall be equipped with standard 2-inch-square operating nuts.

2. Buried valves 2 inches and larger shall have mechanical joint ends, conforming to AWWA C111/A21.11. Valves shall be furnished complete with bolts, nuts, and gaskets.
3. Gate valves shall be manufactured by Mueller, American Flow Control, Kennedy, or approved equal.

2.15 GLOBE AND ANGLE VALVES (TYPE 700 SERIES) (NOT USED)

2.16 PINCH (TYPE 800 SERIES) (NOT USED)

2.17 PLUG (TYPE 900 SERIES)

A. Plug and Seating Design for Eccentric Plug Valves (Type 920): Eccentric plug valves shall comply with MSS SP-108 and the following. Provide a rectangular plug design, with an associated rectangular seat. Provide bidirectional seating design. The valve shall seat with the rated pressure upstream and downstream of the closed plug. Provide geared actuators sized for bidirectional operation.

B. For Type 920 eccentric plug valves, the metallic portion of the plug shall be one-piece design and shall be without external reinforcing ribs which result in a space between the rib and the main body of the plug through which water can pass. Valves shall be repackable without any disassembly of valve or actuator. The valve shall be capable of being repacked while under the design pressure in the open position. Nowhere in the valve or actuators shall the valve shaft be exposed to iron-on-iron contact. Sleeve bearings shall be stainless-steel in valve sizes 20 inches and smaller and bronze or stainless-steel in valve sizes 24 inches and larger. Provide enclosed worm-gear actuators for valves 6 inches and larger.

C. Rubber compounds shall have less than 2% volume increase when tested in accordance with ASTM D471 after being immersed in distilled water at a temperature of 73.4°F ±2°F for 70 hours.

D. Type 920—Cast-Iron Non-Lubricated Eccentric Plug Valves, 4 Inches and Larger

1. Plug valves 4 inches and larger shall be of the non-lubricated eccentric type with resilient faced plugs and shall be furnished with flanges or mechanical-joint end connections to match connecting piping and as shown in the Drawings. Flanged valves shall be 125-pound flanges and faced and drilled to the ASME B16.1, 125-pound standard. Mechanical joint ends shall conform to AWWA C111/A21.11. Valve bodies shall be of ASTM A126 Class B cast-iron. Valves shall be furnished with a welded overlay seat of not less than 90% pure nickel. Seat area shall be raised, with raised surface completely covered with weld to ensure that the plug face contacts only nickel. Screwed-in seats shall not be acceptable. The plug shall have a cylindrical seating surface eccentrically offset from the center of the plug shaft. The interference between the plug face and body seat, with the plug in the closed position, shall be externally adjustable in the field with the valve in the line under pressure. Plugs shall be resilient faced with Hycar (Acrylonitrile-Butadiene) or Buna N, formulated and constructed to be suitable for use with wastewater. Minimum port areas shall be 80% of full pipe flow area. Valves shall have sleeve-type metal bearings and shall be of sintered, oil-impregnated, permanently lubricated Type 316 ASTM. Nonmetallic bearings shall not be acceptable. Valve shaft seals shall be of the multiple V-ring type or U-cup type and shall be externally adjustable and replaceable without removing the bonnet or actuator from the valve under pressure. Valves using O-ring seals or non-adjustable packing shall not be acceptable. All exposed nuts, bolts, springs, washers, and other fasteners shall be 300-series stainless-steel. Valve working pressure ratings shall be a minimum of 150 psi. Each valve shall be given a hydrostatic and seat test with certified copies of proof-of-design test reports as outlined in AWWA C504, Section 5.5. Plug valves shall be DeZurik PEC Series, Henry Pratt Company “Ballcentric” Series, or approved equal.

2.18 SOLENOID VALVES (TYPE 1000 SERIES) (NOT USED)

2.19 OTHER SPECIAL TYPES OF VALVES (TYPE 1100) (NOT USED)

PART 3 EXECUTION

3.01 JOINTS

A. Bolt holes of flanged valves shall straddle the horizontal and vertical centerlines of the pipe run to which the valves are attached. Clean flanges by wire brushing before installing flanged valves. Clean flange bolts and nuts by wire brushing, lubricate threads with oil and graphite, and tighten nuts uniformly and

progressively. If flanges leak under pressure testing, loosen or remove the nuts and bolts, reseat or replace the gasket, reinstall or retighten the bolts and nuts, and retest the joints. Joints shall be watertight.

B. Clean threaded joints by wire brushing or swabbing. Apply Teflon joint compound or Teflon tape to pipe threads before installing threaded valves. Joints shall be watertight.

C. Install lug-type valves with separate hex head machine bolts at each bolt hole and each flange (two bolts per valve bolt hole).

D. Install grooved-end couplings for valves in accordance with Section 15055, Piping Systems—General.

3.02 INSTALLING EXPOSED VALVES

A. Unless otherwise indicated in the Drawings, install valves in horizontal runs of pipe having centerline elevations 4 feet 6 inches or less above the floor with their operating stems vertical. Install valves in horizontal runs of pipe having centerline elevations between 4 feet 6 inches and 6 feet 9 inches above the floor with their operating stems horizontal.

B. Install valves on vertical runs of pipe that are next to walls with their stems horizontal, away from the wall. Valves on vertical runs of pipe that are not located next to walls shall be installed with their stems horizontal, oriented to facilitate valve operation.

3.03 INSTALLING BURIED VALVES

A. Connect the valve, coat the flanges, apply tape wrapping or polyethylene encasement as required on the Drawings, and place and compact the backfill to the height of the valve stem.

B. Place block pads under the extension pipe to maintain the valve box vertical during backfilling and repaving and to prevent the extension pipe from contacting the valve bonnet.

C. Mount the upper slip pipe of the extension in midposition and secure with backfill around the extension pipe. Pour the concrete ring allowing a depression so the valve box cap will be flush with the pavement surface.

D. In streets without concrete curbs and in open areas, install the valve box as for a paved area with concrete curb but include a marker post. Cut the marker post from 4-inch-by-4-inch dense structural grade Douglas fir No. 2 or Southern Pine

No. 2 surfaced on four sides to a length of 5 feet. Chamfer the top. Set the post in concrete, 2 feet into the ground, away from traffic, and to the side of the pipeline. Coat with a seal and finish coat of white alkyd exterior paint. On the side facing the valve, letter in black the word "VALVE" and the distance in feet from the marker post to the valve box cap.

E. Install debris cap as close as possible under the cast-iron cover without interfering with the cover operation. Trim flexible skirt to provide a smooth contact with the interior or the extension pipe.

3.04 INSTALLING EXTENSION STEM GUIDE BRACKETS

A. Install extension stem guide brackets at 6- to 8-foot centers. Provide at least two support brackets for stems longer than 10 feet, with one support near the bottom of the stem and one near the top.

3.05 FIELD COATING BURIED VALVES

A. Coat flanges of buried valves and the flanges of the adjacent piping and the bolts and nuts of flanges and mechanical joints, as specified in Section 09900, Painting and Coating, System No. 24.

B. Wrap buried metal valves 6 inches and larger with polyethylene sheet as specified in Section 15155, Ductile Iron Pipe and Fittings.

3.06 VALVE LEAKAGE AND FIELD TESTING

A. Test valves for leakage at the same time that the connecting pipelines are tested. See Section 15144, Pressure Testing of Piping, for pressure testing requirements. Protect or isolate any parts of valves, actuators, or control and instrumentation systems whose pressure rating is less than the pressure test. Valves shall show zero leakage. Repair or replace any leaking valves and retest.

B. Operate manual valves through three full cycles of opening and closing. Valves shall operate from full open to full close without sticking or binding. Do not backfill buried valves until after verifying that valves operate from full open to full closed. If valves stick or bind or do not operate from full open to full closed, repair or replace the valve and repeat the tests.

C. Test gear actuators through three full cycles from full-open to full-close without binding or sticking. The pull required to operate handwheel- or chainwheel-operated valves shall not exceed 80 pounds. The torque required to operate valves having 2-inch AWWA nuts shall not exceed 150 foot-pounds. If actuators stick or bind or if pulling forces and torques exceed the values stated previously, repair or

replace the actuators and repeat the tests. Operators shall be lubricated in accordance with the manufacturer's recommendations before operating.

WATER SERVICE CARD

Date of Installation _____

Contract Drawing Number_____

Service Line Size (inches) _____
Length of Water Service Line (feet) _____
Meter Size (inches) _____

Name _____
House/Business Address or Location:

_____
_____
_____

Phone # _____

GPS coordinate @ main _____
GPS coordinate @ meter _____
Confirm Photos are attached _____

Installation Foreman _____

Service Layout

Provide a brief sketch of the installed configuration. Indicate lengths, depths of the water service, and show three ties to meter box and to corporation stop:

Depth @ Main (feet) _____
Depth @ stub out (feet) _____

_____ _____
Contractor Signature Resident Observer Signature

(Rev 2 – 15 Oct 2006)

END OF SECTION

SECTION 15121
MISCELLANEOUS PIPE FITTINGS AND ACCESSORIES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section describes requirements for materials and installation of miscellaneous piping specialties, such as quick-connect couplings and flanged coupling adapters.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Submit manufacturer's catalog data and descriptive literature showing dimensions and materials of construction by ASTM reference and grade. Show coatings.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Iron and Steel Institute (AISI)

1. AISI C1012—Specification for Hard-Drawn Low-Carbon Steel.

B. American Society for Testing and Materials (ASTM)

1. ASTM A36/A36M—Standard Specification for Carbon Structural Steel.
2. ASTM A240/A240M—Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
3. ASTM A513/A513M—Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.
4. ASTM A536—Standard Specification for Ductile Iron Castings.
5. ASTM A635/A635M—Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Hot-Rolled, Alloy, Carbon, Structural, High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability, General Requirements for.

6. ASTM C219—Standard Terminology Relating to Hydraulic Cement.
7. ASTM D2000—Standard Classification System for Rubber Products in Automotive Applications.

C. American Society of Mechanical Engineers (ASME)

1. ASME B16.1—Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250.
2. ASME SA36—Carbon Steel Shapes, Plates, and Bars of Structural Quality for Use in Riveted, Bolted, or Welded Construction.
3. ASME SA675— Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties (Carbon Steel Middle Ring or Sleeve).

D. American Water Works Association (AWWA)

1. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
2. AWWA C213—Fusion-Bonded Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
3. AWWA C219—Bolted Sleeve-Type Couplings for Plain-End Pipe.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 METALLIC QUICK-CONNECT COUPLINGS

A. Type 6: Quick-connect couplers shall be female-coupler/female-thread type with locking handles. Provide dust plug and security chain with each coupler. Bodies

and locking handles shall be Type 316 stainless steel. The gasket shall be Teflon. Couplers shall be CIVACON Kamlok 633-D/634-A, Evertite Part D/DP, or equal.

B. Type 8: Quick-connect couplers shall be male-adapter/female-thread type. Provide dust cap and security chain with each coupler. Bodies and locking handles shall be Type 316 stainless steel. The gasket shall be Teflon. Adapters shall be CIVACON Kamlock 633-A/634-B, Evertite Part A/DC, or equal.

C. Type 10: Quick-connect couplers shall be male-adapter/hose-shank type. Provide dust cap with each coupler. Bodies and dust caps shall be Type 316 stainless steel. The gasket shall be Teflon. Adapters shall be CIVACON Kamlok 633-E/634-B, Evertite Part C/DC, or equal.

2.02 COUPLINGS FOR METALLIC PIPING

A. General

1. Thrust Ties: The Contractor shall provide thrust ties where shown and where required to restrain the force developed by 12 times the maximum operating pressure specified.

    a. Steel Pipe: Attach with fabricated lugs.
    b. Ductile Iron Pipe: Attach with bell hanger and wedge restraint glands for buried mechanical joint and push-on joint piping; and thrust retention plates and tie-rods, nuts, washers, and bolts for exposed, flanged piping.

2. Exposed Installations: Zinc-plated nuts and bolts. High-strength, low-alloy steel, in accordance with AWWA C111/A21.11, may be substituted for use on cast-iron and ductile-iron couplings.

3. Buried and Submerged Installations: Provide Type 304 stainless steel tie rods, bolts, and nuts and assemble with an anti-galling compound.

4. Steel Middle Rings and Followers: Fusion-bonded epoxy-lined and coated in accordance with AWWA C213.

5. Restrained couplings or other fittings that use set screws, pointed-end screws to penetrate the outside surface of the pipe for restraint are not acceptable.

B. Flexible Couplings: Coupling shall consist of a steel middle ring or sleeve, two steel or malleable iron flange or follower rings, two wedge-shaped resilient gaskets, and a sufficient number of track-head bolts and nuts.

1. Middle Ring or Sleeve: Steel construction, ASTM A513/A513M, ASTM A635/A635M, or ASME SA675 GR60, fabricated in a true circular section and free of surface defect.

2. Follower Rings or Flanges: Steel construction, AISI C1012 or ASME SA36, fabricated in a true circular section and free of surface defect.

3. Bolts and Nuts: Steel bolt, AWWA C111/A21.22.

4. Gaskets: Grade 27 BUNA-S.

5. Shop Paint: Fusion-bonded epoxy coating.

6. Acceptable Manufacturers:

   a. Dresser Manufacturing Division of Dresser Industries, Inc.
   b. Dresser Styles 38 and 138.
   c. Or approved equal.

C. Transition Couplings: Transition Coupling shall consist of a high-strength steel body, two steel or malleable iron flange or follower rings, a wedge shaped resilient gasket, and a sufficient number of follower bolts.

1. Adapter: Steel construction, ASTM A513/A513M, ASTM A635/A635M or ASME SA675 GR60, free of surface defect.

2. Followers: AISI C1012 or ASME SA36.

3. Bolts: AWWA C 111/ANSI A21.11.

4. Gasket: Grade 27 BUNA-S.

5. Shop Paint: Fusion-bonded epoxy coating.

6. Acceptable Manufacturers:

   a. Dresser Manufacturing Division of Dresser Industries, Inc.; Dresser Styles 62 and 162.
   b. Or approved equal.

D. Flanged Coupling Adapters: Adapters shall consist of a cast-iron or high-strength steel body, two steel or ductile-iron follower rings, a wedge shaped resilient gasket, and a sufficient number of follower bolts.

1. 3- through 12-inch DIP Flange Adapters

a. Adapter: Ductile iron construction, ASTM A536, Grade 65-45-12, free of surface defect. Adapter shall be rated to 200 psi working pressure in accordance with AWWA C219, and -20°F to 212°F.

b. Flanges: Ductile iron construction, ASTM A536, Grade 65-45-12, free of surface defect. Bolt circles and bolt holes shall match those of ASME B16.1 Class 125 flanges.

c. Bolts and nuts: Corrosion-resistant alloy bolts and nuts.

d. Gasket: Grade 27 BUNA-S.

e. Shop paint: fusion-bonded powder epoxy coating.

f. Acceptable Manufacturers:

(1) Dresser Manufacturing Division of Dresser Industries, Inc.; Dresser Style 127.
(2) Or Equal.

2.03 BOLTED SPLIT-SLEEVE AND SINGLE- POINT CLOSURE COUPLINGS

A. Bolted, split-sleeve, and single-point closure couplings shall meet the materials and performance conforming to AWWA C219, which shall be used for steel pipe and stainless steel pipe.

B. When the connecting piping is carbon steel, the coupling shall be manufactured from ASTM A36/A36M carbon steel. When the connecting piping is stainless steel, the coupling shall be manufactured from ASTM A240/A240M Type 316/316L stainless steel.

C. The coupling shall be of the split type with a single-point closure coupling. Provide welded restraint rings on the pipe ends for end restraint. As the coupling closes, it shall confine an elastomeric o-ring type gasket on each pipe end to create a radial seal. The axial seal shall be affected at the closure plates as bolts pull the coupling snug round the pipe.

D. The coupling manufacturer shall provide the restraint rings for each coupling. The Contractor's fabricator shall weld the restraint rings to the pipe in strict accordance with the coupling manufacturer's recommendations.

E. For water service, the elastomeric o-ring type gaskets shall be EPDM (or other material accepted by the Engineer) conforming to ASTM D2000 for the design pressure for the temperature range of -20°F to 180˚F.

F. Type C201 shall be a shouldered, bolted, split-sleeve, fully restrained coupling. Type C201 coupling shall be Depend-O-Lok F x F (Fixed x Fixed), Type 2 manufactured by Victaulic, Depend-O-Lok, Inc., or approved equal.

G. Type C202 shall be a shouldered, bolted, split-sleeve, fully restrained coupling that allows angular deflection of the connecting pipes. Type C202 coupling shall be Depend-O-Lok F x F (Fixed x Fixed), Type 2, Modified manufactured by Victaulic, Depend-O-Lok, Inc., or approved equal.

PART 3 EXECUTION

3.01 INSTALLING QUICK-CONNECT COUPLINGS

A. Attach to piping in accordance with the relevant piping specification.

3.02 INSTALLING COUPLINGS

A. Pipe for use with flexible couplings shall have plain ends as specified in the respective pipe sections in Division 15, Mechanical.

B. Alloy steel bolts and nut for flanged joints shall be made with high-strength, low-alloy Cor-Ten bolts, nuts, and washers. Cor-Ten for mechanical joints shall be made with mild corrosion resistant alloy steel bolts and nuts. All exposed bolts shall be painted the same color as the pipe. All joints to be wrapped with 8-mil color-coded poly wrap.

C. Before sleeve-type couplings are installed, the pipe ends shall be cleaned thoroughly for a distance of 8 inches. Soapy water may be used as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6 inches from the end, and the middle ring shall be placed on the substantial completion date unless otherwise requested by the Owner.

D. Mechanical joints shall be made in the standard manner. Valve stems shall be vertical in all cases. Set cast-iron box as shown on the Drawings. Boxes shall have sufficient bracing to maintain alignment during backfilling. Knobs on cover shall be parallel to pipe. Remove any sand or undesirable fill from valve box after

installation. Extend tracing wire outside of valve box extension pipe and enter at valve box.

E. Thoroughly clean oil, scale, rust, and dirt from the pipe to provide a clean seat for the gasket.

F. Wipe gaskets clean before installations.

G. Lubricate flexible couplings and flanged coupling adapter gaskets with soapy water or manufacturer's standard lubricant before installing on the pipe ends.

H. Install couplings, service saddles, and anchor studs in accordance with the manufacturer's instruction.

I. Tighten bolts progressively, drawing up bolts on opposite sides a little at a time until all bolts have a uniform tightness.

J. Use torque-limiting wrenches to tighten bolts to the manufacturer's specified torque values.

END OF SECTION

SECTION 15125
PIPING APPURTENANCES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall furnish all labor, materials, equipment, and incidentals required and install complete and ready for operation all piping appurtenances as shown on the Drawings and as specified in this Section.

B. All piping appurtenances shall be of the size shown on the Drawings. All equipment of the same type shall be from one manufacturer, unless authorized in writing by the Engineer.

C. All piping appurtenances shall have the name of the manufacturer and the working pressure for which they are designed cast in raised letters upon the body.

D. The piping appurtenances shall include, but not be limited to, the following:

1. Tapping Saddles.
2. Tapping Sleeves and Valves.
3. Pressure Gauge Assembly.
4. Fire Hydrant.
5. Water Meter.
6. Strainers.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Product technical submittal data shall contain the following information and data:

1. Acknowledgment that products submitted meet requirements of standards referenced.

2. Manufacturer’s installation instructions.

3. Expansion joints, flexible joints, couplings, adaptors, tapping sleeves, and other appurtenances:

a. Pressure and temperature rating.

b. Materials of construction.
c. Linings.
d. Dimensions and weight.
e. Accessories.
f. Manufacturer's product brochures, cut-sheets, and parts diagrams.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Iron and Steel Institute (AISI)

1. AISI Type 304L—Stainless Steel.
2. AISI Type 316—Stainless Steel, Annealed Sheet.

B. American Society for Testing and Materials (ASTM)

1. ASTM A536—Standard Specification for Ductile Iron Castings.
2. ASTM C285—Standard Test Methods for Sieve Analysis of Wet-Milled and Dry-Milled Porcelain Enamel.

C. American Society of Mechanical Engineers (ASME)

1. ASME B16.5—Pipe Flanges and Flanged Fittings NPS 1/2 through NPS 24 Metric/Inch Standards.

D. American Water Works Association (AWWA)

1. AWWA C105/A21.5—Polyethylene Encasement for Ductile-Iron Pipe Systems.
2. AWWA C153/A21.53—Ductile-Iron Compact Fittings.
3. AWWA C207—Steel Pipe Flanges for Waterworks Service, Sizes 4-Inch through 144-Inch (100 mm through 3,600 mm).
4. AWWA C210—Liquid-Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
5. AWWA C213—Fusion-Bonded Epoxy Coatings and Linings for Steel Water Pipe and Fittings.
6. AWWA C500—Metal-Seated Gate Valves for Water Supply Service.
7. AWWA C502—Dry-Barrel Fire Hydrants.

8. AWWA C700—Standard for Cold-Water Meters—Displacement Type, Metal Alloy Main Case.
9. AWWA C800—Underground Service Line Valves and Fittings.

E. National Sanitation Foundation (NSF)

1. NSF 61—Drinking Water System Components – Health Effects.

1.04 DELIVERY, HANDLING, AND STORAGE

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

B. All piping appurtenances, unless otherwise directed, shall be loaded and unloaded by lifting, and under no circumstances shall any piping appurtenances be dropped, skidded, or rolled.

C. Slings, hooks, or tongs used for lifting shall be padded to prevent damage to exterior surface or interior linings of piping appurtenances. If any part of the coating, lining, or components is damaged, the Contractor shall make repairs or replacement at his expense and in a manner satisfactory to the Engineer before attempting to install such piping appurtenances.

D. Only new piping appurtenances will be allowed for installation and shall be stored to prevent damage and be kept free of dirt, mud, or other debris.

1.05 QUALIFICATIONS

A. All of the piping appurtenances shall be products of well-established firms that are fully experienced, reputable, have been selling this product for a minimum of 10 years, and qualified in the manufacture of the particular product furnished. The piping appurtenances shall be designed, constructed, and installed in accordance with the requirements and procedures of applicable AWWA standards and shall comply with these Specifications as applicable.

PART 2 PRODUCTS

2.01 TAPPING SADDLE

A. Saddle body shall be made of malleable iron, ductile iron, or bronze. Malleable iron and ductile iron shall be epoxy or nylon coated. Saddles shall be of the single- or multiple-strap design (multiple straps are required for sizes 10 inches and above). The straps shall be made from Type 304 stainless steel or bronze. The

straps shall have a nominal width of 2 inches. Strap studs shall be made from AISI Type 304L stainless steel.

B. Nuts and washers shall be made from Type 304 stainless steel and shall be treated to prevent galling. The straps shall have a curvature accurately formed to meet the diameter of the pipe on which the service saddle is to be installed. A Neoprene gasket shall be securely glued to or imbedded in the body of the clamp to ensure positive sealing against the pipe. Outlet sizes of 3/4 inch and 1 inch shall have female C.C. thread while the outlet for 1-1/2 inches and 2 inches shall be female I.P. thread.

C. Tapping saddles shall not be used on HDPE due to expansion and contraction problems unless specifically approved in writing by the Engineer on a case-by-case basis.

2.02 TAPPING SLEEVES AND VALVES

A. Tapping sleeves and valves shall be designed for a minimum water working pressure of 150 psi and shall be tested at 300 psi. The design shall allow for the insertion of bolts from either side and the internal seal is to be the "O-ring" type. The tapping sleeve shall be furnished complete with bolts, nuts, and gaskets.

B. With the exception of the valve ends and other modifications necessary for tapping service, tapping valves shall conform to AWWA C500 and shall be Mueller "No. T-2360" or approved equal. Each tapping valve shall be provided with a flanged inlet end designed, faced, and drilled for attachment to the outlet flange of the tapping sleeve; an outlet end provided with a tapping flange for attachment of a standard drilling machine; and a mechanical-joint-type bell end for connection of the branch main.

C. Tapping sleeves for 4-inch- through 24-inch-diameter pipe shall be epoxy-coated fabricated-steel construction and manufactured to meet material specification ASTM C285 Grade C for the body. The flange shall conform to AWWA C207 Class D and have an ANSI 150-pound drilling and recessed for tapping valve.

D. Tapping sleeves shall be of the flanged outlet type designed for attachment to the flanged inlet end of the tapping valve and shall be provided with mechanical joint ends at each end of the run. Tapping sleeves shall be Mueller "No. H-615" or approved equal.

2.03 PRESSURE-GAUGE ASSEMBLY

A. Pressure-gauge assemblies shall be provided at locations listed below or as shown on the Drawings. All pressure-gauge assemblies shall include a pressure gauge,

AISI Type 316 stainless steel, NPT threaded ball valves for isolation and venting, and sensor piping. Sensor piping tubing and fittings shall be Type 316 stainless steel. The pressure gauge shall be constructed of Type 316 stainless-steel wetted parts and Type 304 stainless-steel case and bayonet ring, adjustable pointer, laminated safety-glass window, glycerin liquid-filled case, 1.5% span accuracy, and shall have a 2.5-inch-diameter dial size, minimum. The pressure gauge shall be as manufactured by WIKA Instrument Corporation, Type LM 233.54, or approved equal.

B. The Contractor shall furnish and install pressure-gauge assemblies with pressure-gauge ranges as follows and/or shown on the Drawings.

2.04 FIRE HYDRANT

A. Fire hydrants shall be in accordance with AWWA C502, for dry barrel-type fire hydrants. Fire hydrants shall meet the following requirements:

Catalogue and maintenance data	Required.
Type of shutoff	Gate.
Size of hydrant (valve opening)	6-inch.
Inlet connection	6-inch, verify with Drawings.
Outlet nozzles	Two 2.5-inch hose and one 4.5-inch pumper.
Outlet nozzle threads	See Note 1.
Direction to open	Counterclockwise.
Stem seals	O-ring.
Outlet nozzle cap chains	Required.
Drain outlet, non-corrodible	Required.
Traffic breakaway body and valve rod	Required.
Working pressure rating	200 psi (minimum).
Fire hydrant wrenches	Provide five wrenches as spare parts.
Nozzle wrenches	Provide five wrenches as spare parts for each size nozzle provided.
Breakaway repair kit	Provide five kits as spare parts.

Notes

1. Outlet nozzle threads shall be the Owner's standard fire hydrant thread. The Contractor shall verify thread type before submittal.

B. Hydrants shall have Underwriter's Laboratory (UL) and Factory Mutual (FM) approvals. Hydrant exteriors shall be painted with one coat of zinc-chromate alkyd primer and two finish coats of approved paint of the color required by the Owner. Hydrant interiors shall be painted with a paint system approved by NSF

for use in potable water. Working parts shall be bronze. All internal parts shall be removable through the top of the hydrant. Hydrants shall conform to NFPA 24.

C. Fire hydrant extensions shall be provided at no additional cost to the Owner to meet final grade requirements. All hydrants shall stand plumb. No portion of the fire hydrant shall be within 6 inches of a sidewalk. After installation, all hydrants shall be inspected, cleaned, and opened and closed as many times as required to verify that all aspects of the hydrant work properly.

D. Fire hydrants shall be American Darling FHA B-84-B, or equal.

2.05 WATER METER

A. Water meters through 2-inch diameter shall comply with AWWA C700 and NSF 61 standards. Water meters through 6-inch diameter shall comply with AWWA C715 and NSF 61 standards. The meter housing, bottom plates, and trim shall be bronze. The measuring chamber, disc, strainer, generator housing, register lid, and shroud shall be thermoplastic. The magnet shall be ceramic. The disc and magnet spindles shall be stainless steel. External bolts shall be non-corrosive metal.

B. Water meters shall be rated for continuous operation and have a maximum operating pressure of 150 psi. The measuring element shall be a positive displacement mutating disc. An oscillating piston-type meter is not acceptable. The sealed register shall consist of a straight reading, odometer-type totalizing display with a 10,000,000-gallon capacity (minimum) for meters smaller than the 1.5-inch unit and a 100,000,000-gallon capacity (minimum) for the 1.5-inch meter and larger, 360º test circle with center sweep hand, and flow finder to detect leaks. All meters shall have rigid, non-ferrous strainers that are easily removable and have an effective straining area of double that of the main-case inlet.

C. The meters shall have the following minimum characteristics:

Meter Size (inches)	Minimum Test Flow	Normal Test Flow Limits	Pressure Loss @AWWA Max. Cap.	Laying Length (inches)
5/8 x 3/4	1/4 gpm	1/2 – 20 gpm	5.0 psi	7-1/2
3/4 x 3/4	3/8 gpm	3/4 – 30 gpm	7.5 psi	7-1/2 (only)
1	3/4 gpm	1-1/4 – 50 gpm	7.0 psi	10-3/4
1-1/2	1-1/4 gpm	2-1/2 – 100 gpm	7.5 psi	12-5/8 or 13
2	1-1/2 gpm	2-1/2 – 160 gpm	9.0 psi	15-1/4 or 17
6	9 gpm	40 – 800 gpm	2.0 psi	18

D. Water meters up to 2 inches in diameter shall be Badger Recordall Model, Neptune, or approved equal. Water meters greater than 6" in diameter shall be Neptune Mach 10 Ultrasonic or approved equal. Headloss through the meter shall not exceed the published headloss through the named meters at any point on the headloss curve.

E. Water meters larger than 1 inch shall have flanges for inlet and outlet connections; other water meters shall have threaded male inlet and outlet. All meters shall be easily removed from the installed piping.

2.06 STRAINERS

A. Strainers shall be installed where indicated on the Drawings and as specified in this Section. Unless specified otherwise, strainers shall be Y-pattern units with flanged ends and cap, brass or cast-iron body, and stainless steel screens. Screens shall have 40-mesh perforations. Strainers shall be Neptune or approved equal. The blow off from each strainer shall be equipped with a shutoff valve. Blow-down shutoff valves 3/4-inch and smaller shall be provided with male threaded hose adapters. Strainers upstream from double mechanical pump seals shall have 80-mesh screens.

B. A strainer installed in piping immediately upstream from a solenoid valve in water service shall be a Y-pattern unit with brass or bronze body and monel or stainless steel screen. Strainers shall be Neptune or approved equal. The blow off from each strainer shall be equipped with a shutoff valve.

C. A strainer installed in piping immediately upstream from each 2-inch or smaller pressure-reducing valve shall be a Y-pattern unit with bronze, brass, or cast-iron body and monel or stainless steel screen. Strainers shall be Neptune or approved equal. Strainers installed in copper piping shall be of bronze or brass construction. The blow off from each strainer shall be equipped with a shutoff valve.

2.07 TOOLS

A. If required for normal operation and maintenance, special tools shall be supplied with the equipment. Two T-handle wrenches to operate standard 2-inch nuts on buried valves and buried valve actuators shall be provided as part of the work.

PART 3 EXECUTION

3.01 INSTALLATION

A. The Contractor shall install all piping appurtenances as shown on the Drawings.

B. All piping appurtenances shall be installed in the location shown, unless approved otherwise, true to alignment and rigidly supported. Any damage to the above items shall be repaired to the satisfaction of the Owner and the Engineer.

C. Install concrete inserts for hangers and supports as soon as forms are erected and before concrete is poured. Before setting these items, the Contractor shall check all plans and figures which have a direct bearing on their location and shall be responsible for the proper location of these piping appurtenances during the construction of the structures.

3.02 SHOP PAINTING

A. Exterior surfaces of ferrous valves and piping appurtenances shall be painted in accordance with Section 09900, Painting and Coating, unless noted or specified otherwise.

3.03 INSPECTION AND TESTING

A. Completed valves and piping appurtenances shall be subjected to hydrostatic pressure test as described in Section 15055, Piping Systems—General, and the detail pipe sections of these Specifications. All leaks in valves and piping appurtenances shall be repaired and lines retested as approved by the Engineer. Before testing, the valves and pipelines shall be supported and thrust restrained for forces in excess of the test pressure to prevent movement during tests.

END OF SECTION

SECTION 15141
DISINFECTION OF PIPING AND WATER STORAGE FACILITIES

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section describes requirements for materials and procedures for disinfecting water mains by the continuous feed method and the slug method as well as for disinfecting water storage facilities. The Contractor shall disinfect piping in accordance with Rule 62-555.340, FAC, and AWWA C651 and disinfect water storage facilities in accordance with Rule 62-555.340, FAC, and AWWA C652, except as modified below.

B. Use potable water for chlorination.

C. Submit request for use of water from waterlines of the Owner at least 48 hours in advance.

D. If water for disinfection and/or flushing is supplied from a temporary connection to the existing distribution system, appropriate backflow prevention methods shall be used.

E. Proper disposal of the chlorinated disinfection water and the flushing water is the Contractor's responsibility. Disinfected water shall be neutralized in accordance with AWWA C651 and C652 before discharge.

F. Before permit review and coordination with the Owner and appropriate regulatory authorities (i.e., FDEP and Pasco County Health Department), the Contractor shall provide a schedule for the rate of flow and locations of discharges for the disinfection of piping and water storage facilities. The neutralized discharge water shall be disposed of by discharging to the nearest sanitary sewer (check with the Owner) to the local stormwater system through on-site swales or by other approved means. Discharge to the local stormwater system shall be routed to avoid swale overflow and/or erosion. The Contractor shall be responsible for any damage that occurs related to the discharging process. The Contractor shall repair or replace any damage caused by discharging to the Owner’s satisfaction at no additional expense to the Owner.

G. It is the responsibility of the Contractor to implement and enforce strict adherence to safety guidelines which are addressed in AWWA C651 and C652 as well as safety and handling instructions from the manufacturer. The Contractor shall

comply with all applicable national, state, and local safety regulations and requirements, including OSHA.

1.02 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Water Works Association (AWWA)

1. AWWA B300—Hypochlorites.
2. AWWA B301—Liquid Chlorine.
3. AWWA C651—Disinfecting Water Mains.
4. AWWA C652—Disinfection of Water – Storage Facilities.

B. Florida Administrative Code (FAC)

1. FAC 62-555.340—Disinfection and Bacteriological Evaluation of Public Water System Components.

1.03 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.04 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.05 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 LIQUID CHLORINE

A. Liquid chlorine shall conform to AWWA B301 and shall be applied in strict accordance with AWWA C651 and AWWA C652.

2.02 CALCIUM HYPOCHLORITE (DRY)

A. Calcium hypochlorite shall conform to AWWA B300 and shall be applied in strict accordance with AWWA C651 and AWWA C652. Calcium hypochlorite intended for swimming pool chlorination shall not be used under any circumstances.

2.03 SODIUM HYPOCHLORITE (SOLUTION)

A. Sodium hypochlorite shall conform to AWWA B300 and shall be applied in strict accordance with AWWA C651 and AWWA C652.

2.04 CHLORINE RESIDUAL TEST KIT

A. For measuring chlorine concentration, the Contractor shall supply and use a medium-range, drop count, DPD drop dilution method kit in accordance with AWWA C651 and AWWA C652. Maintain kits in good working order available for immediate test of residuals at point of sampling.

PART 3 EXECUTION

3.01 GENERAL DISINFECTION PROCEDURE

A. Before disinfection, the Contractor shall inspect materials for quality. The Contractor shall use materials and equipment that are appropriate for the disinfection methods selected. The Contractor shall observe the precautionary guidelines given in AWWA C651 and C652.

B. During construction, the Contractor shall take preventative measures in accordance with AWWA C651 to protect materials from contamination.

C. Hydrostatic testing shall be successfully performed before disinfection.

D. Before disinfection, the Contractor shall clear water mains and water storage facilities of foreign debris:

1. Pipelines which are less than 24 inches in diameter shall be flushed, while pipelines which are greater than 24 inches in diameter may be cleared via broom-sweeping in accordance with AWWA C651 and as specified in Section 15144, Pressure Testing of Piping. Sweepings shall be removed from pipeline before the disinfection process begins.
2. Water storage facilities shall be cleared of all materials that are not part of the structural or operating facilities of the tank and shall be cleared of all

debris in accordance with AWWA C652. After the water storage facility has been cleaned, all screened openings shall be inspected for quality of materials and adequate condition to prevent the entry of insects, birds, and other possible contaminants into the tank. The Contractor shall properly disinfect any materials that enter the tank after cleaning in accordance with AWWA C652 before placement in the tank.

E. In accordance with AWWA C651 and C652 procedures, the Contractor shall disinfect all newly constructed materials and existing materials which may have been contaminated during construction. The Contractor shall provide adequate documentation that the required disinfection level (i.e., required chlorine residual and contact time) was successfully achieved.

F. In accordance with Rule 62-555.340, FAC, following disinfection the total chlorine residual in the water mains and water storage facilities shall be reduced to 4 mg/L. The chlorine residual may be reduced via flushing with potable water or by a neutralizing agent that conforms to AWWA C651 and C652.

G. After the total chlorine residual has been reduced to 4 mg/L, the Contractor shall conduct bacteriological testing for water mains and water storage facilities. Bacteriological sampling and testing shall be performed in accordance with Rule 62-555.340, FAC.

H. The Contractor shall dispose of residue from cleaning and other construction operations as well as water from dewatering operations in a manner satisfactory to FDEP and the Pasco County Health Department.

3.02 CONTINUOUS-FEED METHOD FOR PIPELINES

A. Continuous-feed disinfection shall be performed in accordance with AWWA C651. The Contractor shall introduce potable water into the pipeline at a constant measured rate. Feed the chlorine solution into the same water at a measured rate. Proportion the two rates so that the free chlorine concentration in the pipeline is maintained at a minimum concentration of 25 mg/L. Inject chlorine into the main at a point no greater than 3 feet downstream of the start of the new water main. Using the appropriate test kits specified by AWWA C651, the Contractor shall check the concentration at points downstream during the filling to ascertain that sufficient chlorine is being added. The water main shall be completely filled with chlorinated water. The chlorine contact time shall be at least 24 hours. The water shall be chlorinated so that after 24 hours the concentration of free chlorine residual in the water main shall be not less than 10 mg/L.

3.03 SLUG METHOD FOR PIPELINES

A. The Contractor shall perform slug method disinfection in accordance with AWWA C651. Introduce the water in the pipeline at a constant measured rate. At a point no greater than 3 feet downstream of the start of the new water main, feed the chlorine solution into the pipeline at a measured rate so that the free chlorine concentration created in the pipeline is 100 mg/L. Using the appropriate test kits specified by AWWA C651, the Contractor shall check the concentration at points downstream during the filling to ascertain that sufficient chlorine is being added. Feed the chlorine for a sufficient period to develop a solid column or "slug" of chlorinated water that will, as it passes through the line, expose all interior surfaces to a concentration of at least 100 mg/L for at least 3 hours.

3.04 DISINFECTION OF VALVES, BLIND FLANGES, AND APPURTENANCES

A. During the period that the chlorine solution is in the pipeline or as the slug comes into contact with hydrants and valves, open and close valves at least three times to obtain a chlorine residual at hydrants and other pipeline appurtenances. Swab exposed faces of valves and blind flanges before bolting flanges in place with a 1% sodium hypochlorite solution.

3.05 DISINFECTION OF CONNECTIONS TO EXISTING PIPELINES

A. The Contractor shall disinfect isolation valves, pipe, and appurtenances in accordance with AWWA C651, Section 4.7. Flush with potable water until discolored water, mud, and debris are eliminated. Swab interior of pipe and fittings with a 1% sodium hypochlorite solution. After disinfection, flush with potable water again until water is free of chlorine odor.

3.06 CONFIRMATION OF RESIDUAL

A. After the chlorine solution applied by the continuous feed method has been retained in the pipeline for 24 hours, the Contractor shall confirm that a free chlorine residual of 10 mg/L minimum exists along the pipeline by sampling at air valves and other points of access, such as tapping valves.

B. With the slug method, confirm by sampling as the slug passes each access point and as it leaves the pipeline that the free chlorine concentration in the slug is at least 50 mg/L. If the free chlorine residual is less than 50 mg/L, the flow shall be stopped and the slug residual concentration shall be increased to 100 mg/L before disinfection may resume.

3.07 PIPELINE FLUSHING

A. After confirming the free chlorine residual and sufficient contact time, the Contractor shall flush the excess chlorine solution from the pipeline until the free chlorine concentration in the water leaving the pipe is no higher than 4 mg/L.

3.08 BACTERIOLOGICAL SAMPLING AND TESTING

A. In accordance with Rule 62-555.340, FAC, the Contractor shall collect and deliver required samples to a certified laboratory and obtain a bacteriologic quality test to demonstrate the absence of coliform organisms in each separate section of the pipeline and in each structure after chlorination and refilling. Samples shall be delivered to a certified laboratory within 6 hours of sampling:

1. For water mains, collect at least one set of samples from every 1,200 feet of the new water main, plus one set from the end of the line and at least one set from each branch. At each connection to an existing pipeline, take two additional samples.
2. The Contractor shall take care in the sampling of water storage facilities to ensure that the water sampled is representative of the facility. To obtain a representative sample, the storage facility shall be sampled from a tap connected directly to the storage facility or at a sample tap located on the outlet piping.

B. The Contractor shall take chlorine residual samples at the time bacteriological samples are taken. If the chlorine residual is greater than 4 mg/L, the bacteriological test shall be considered invalid and the residual shall be reduced to 4 mg/L and the bacteriological testing shall be performed until the required criteria are satisfied.

C. In accordance with AWWA C652, the Contractor shall test the water in the storage facility to ensure that no offensive odor has been imparted from the disinfection process.

3.09 REPETITION OF PROCEDURE

A. If the initial chlorination fails to produce required residuals and bacteriologic tests, the Contractor shall repeat the chlorination and testing until satisfactory results are obtained.

B. If the water main is installed before satisfactory bacteriological results are achieved, a precautionary boil water notice must be issued if recommended by the water supplier or if recommended by the Florida Department of Health's

"Guidelines for the Issuance of Precautionary Boil Water Notices" in accordance with Rule 62-555.340, FAC.

3.10 TEST FACILITY REMOVAL

A. After satisfactory disinfection, the Contractor shall disinfect and replace air valves, restore the pipe coating, and complete the pipeline where temporary disinfection or test facilities were installed.

3.11 PIPING TO BE DISINFECTED

A. Disinfect all piping as indicated on the Piping Schedule on the Drawings.

3.12 DISINFECTION OF STRUCTURES (NOT USED)

END OF SECTION

SECTION 15144
PRESSURE TESTING OF PIPING

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section specifies the hydrostatic, pneumatic, and leakage testing of pressure piping for pumping stations, wastewater treatment plants, water treatment plants, and other facilities; water distribution and transmission mains; and raw sewage force mains and lift stations.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. Test bulkhead locations and design calculations, pipe attachment details, and methods to prevent excessive pipe wall stresses.

B. Six copies of the test records to the Engineer upon completion of the testing.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Water Works Association (AWWA)

1. AWWA C600—Installation of Ductile Iron Mains and Their Appurtenances.
2. AWWA C605—Underground Installation of Polyvinyl Chloride (PVC) and Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe and Fittings.
3. AWWA C906—Polyethylene (PE) Pressure Pipe and Fittings, 4-Inch through 63-Inch (100 mm through 1,650 mm), for Waterworks.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 TEST PRESSURES

A. Test pressures for the various services and types of piping are shown in the Piping Schedule in the Drawings. At a minimum, the Contractor shall perform pressure and leakage test at 1.5 times the maximum system pressure or 100 psi, whichever is greater (based on the elevation or the lowest point of the section under test and corrected for gage location).

1.07 TESTING RECORDS

A. The Contractor shall provide records of each piping installation during the testing. These records shall include the following information:

1. Date and times of test.
2. Identification of process, pipeline, or pipeline section tested or retested.
3. Identification of pipeline material.
4. Identification of pipe specification.
5. Test fluid.
6. Test duration.

B. Test pressure at low point in process, pipeline, or pipeline section.

C. Remarks: Leaks identified (type and location), types of repairs, or corrections made.

D. Certification by the Contractor that the leakage rate measured conformed to the Specifications.

1.08 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 VENTS AND DRAINS FOR ABOVEGROUND PIPING

A. The Contractor shall install vents on the high points of aboveground piping, whether shown in the Drawings or not. Install drains on low points of aboveground piping, whether shown in the Drawings or not. Provide a valve at each vent or drain point. Valves shall be 3/4 inch for piping 3 inches and larger and 1/2 inch for piping smaller than 3 inches. Valves shall be ball or gate valves unless otherwise shown on the Drawings. Valves shall be rated for the pressure of the adjacent piping and shall be suitable for use with the adjacent pipe material.

2.02 MANUAL AIR-RELEASE VALVES FOR BURIED PIPING

A. The Contractor shall provide temporary manual air-release valves at test bulkheads for pipeline test. Construct the pipe outlet in the same manner as for a permanent air valve and, after use, seal with a blind flange, pipe cap, or plug and coat the same as the adjacent pipe.

2.03 TEST BULKHEADS

A. The Contractor shall design and fabricate test bulkheads in accordance with Section VIII of the ASME Boiler and Pressure Vessel Code. Materials shall comply with Part UCS of the code. Design pressure shall be at least 2.0 times the specified test pressure for the section of pipe containing the bulkhead. Limit stresses to 70% of yield strength of the bulkhead material at the bulkhead design pressure. Include air-release and water drainage connections.

2.04 TESTING FLUID

A. The Owner will provide a source of supply from the existing treated water distribution system for the Contractor’s use in filling the lines. An air-break shall be maintained at all times between the Owner’s distribution system and the Contractor’s equipment to prevent cross-connection. The line shall be slowly filled with water and the specified test pressure shall be maintained in the pipe for the entire test period by means of a pump furnished by the Contractor. Provide accurate means for measuring the quantity of water required to maintain this pressure. The amount of water required is a measure of the leakage.

B. Testing fluid shall be potable water unless a pneumatic test is indicated on the Piping Schedule.

C. For fuel oil piping, use potable water for hydrostatic testing and flushing.

D. For potable water pipelines, obtain and use only potable water for hydrostatic testing.

E. Submit request for use of water from waterlines of the Owner 48 hours in advance.

F. The Contractor shall provide back flow prevention control for temporary connections to existing water mains.

2.05 TESTING EQUIPMENT

A. The Contractor shall provide calibrated pressure gauges, pipes, bulkheads, pumps, compressors, chart recorder, and meters to perform the hydrostatic testing. The Contractor shall provide any necessary assistance required for testing.

PART 3 EXECUTION

3.01 TESTING PREPARATION

A. Pipes shall be in place, backfilled, and anchored before beginning pressure testing.

B. The Contractor shall conduct pressure tests on exposed and aboveground piping after the piping has been installed and attached to the pipe supports, hangers, anchors, expansion joints, valves, and meters.

C. For buried piping, the pipe may be partially backfilled and the joints left exposed for inspection during an initial leakage test. However, perform the final pressure test after completely backfilling and compacting the trench.

D. Provide any temporary piping needed to carry the test fluid to the piping that is to be tested. After the test has been completed and demonstrated to comply with the Specifications, disconnect and remove temporary piping. Do not remove exposed vent and drain valves at the high and low points in the tested piping; remove any temporary buried valves and cap the associated outlets. Plug taps or connections to the existing piping from which the test fluid was obtained.

E. Provide temporary drain lines needed to carry testing fluid away from the pipe being tested. Remove such temporary drain lines after completing the pressure testing.

F. Before starting the test, the Contractor shall notify the Engineer and the Owner's Representative.

3.02 CLEANING

A. Before conducting hydrostatic tests, the Contractor shall flush pipes with water to remove dirt and debris. For pneumatic tests, blow air through the pipes. Maintain a flushing velocity of at least 3 fps for water testing and at least 2,000 fpm for pneumatic testing. Flush pipes for the period given by the formula

$$T = \frac{2L}{3}$$

in which:

T = flushing time (seconds)
L = pipe length (feet).

B. For pipelines 24 inches or larger in diameter, acceptable alternatives to flushing are use of high-pressure water jet, sweeping, or scrubbing. Water, sediment, dirt, and foreign material accumulated during this cleaning operation shall be discharged, vacuumed, or otherwise removed from the pipe.

3.03 TESTING AND DISINFECTION SEQUENCE FOR POTABLE WATER PIPING

A. Perform required disinfection after hydrostatic testing, unless otherwise indicated.

B. Disinfection shall be performed as described in Section 15141, Disinfection of Piping and Water Storage Facilities.

3.04 LENGTH OF TEST SECTION FOR BURIED PIPING

A. The maximum length of test section for buried pipe of 12 inches or smaller in diameter is 3,500 feet; for buried pipe larger than 12 inches, 1 mile. Provide intermediate test bulkheads where the pipeline length exceeds these limits.

3.05 INITIAL PIPELINE FILLING FOR HYDROSTATIC TESTING

A. The maximum rate of filling shall not cause the water velocity in the pipeline to exceed 1 fps. Filling may be facilitated by removing automatic air valves and releasing air manually.

3.06 TESTING NEW PIPE WHICH CONNECTS TO EXISTING PIPE

A. Before testing new pipelines that are to be connected to existing pipelines, the Contractor shall isolate the new line from the existing line by test bulkheads,

spectacle flanges, or blind flanges. After the new line has been successfully tested, remove test bulkheads or flanges and connect to the existing piping.

3.07 HYDROSTATIC TESTING OF ABOVEGROUND OR EXPOSED PIPING

A. Open vents at high points of the piping system to purge air while the pipe is being filled with water. Venting during system filling may also be provided by temporarily loosening flanges.

B. Subject the piping system to the test pressure indicated on the Piping Schedule in the Drawings. Maintain the test pressure for a minimum of 2 hours. Examine joints, fittings, valves, and connections for leaks. The piping system shall show zero leakage or weeping. Correct leaks and retest until zero leakage is obtained.

3.08 HYDROSTATIC TESTING OF BURIED PIPING

A. Where any section of the piping contains concrete thrust blocks or encasement, the Contractor shall not make the pressure test until at least 10 days after the concrete has been placed. When testing mortar-lined or PVC piping, fill the pipe to be tested with water and allow it to soak for at least 24 hours to absorb water before conducting the pressure test.

B. Apply and maintain the test pressure by a positive displacement hydraulic force pump.

C. Maintain the test pressure for the 2 hours by restoring the pressure whenever it falls 5 psi.

D. After the test pressure is reached, use a meter to measure the additional water added to maintain the pressure. This amount of water is the loss due to leakage in the piping system. The allowable leakage volume is defined by the formulas:

PVC Pipe:

$$L = \frac{ND(P)^{1/2}}{C}$$

in which:

L = allowable leakage (gallons)
N = number of rubber-gasketed joints in the pipe tested
D = diameter of the pipe (inches)
P = specified test pressure (psig)
C = 7,400

Ductile Iron Pipe:

$$L = \frac{SD(P)^{1/2}}{C}$$

in which:

L = allowable leakage (gallons)
S = length of pipe tested (feet)
D = diameter of the pipe (inches)
P = specified test pressure (psig)
C = 133,200

HDPE Pipe: As specified in Section 15146, High-Density Polyethylene (HDPE) Pipe.

E. The leakage test shall be a separate test following the pressure test and shall not be less than 2 hours long. All leaks evident at the surface shall be repaired and leakage eliminated regardless of the total leakage as shown by test. Lines that fail to meet tests shall be repaired and retested as necessary until test requirements are complied with. Defective materials, pipes, valves, and accessories shall be removed and replaced.

F. The allowable leakage for buried piping having threaded, brazed, or welded (including solvent welded) joints shall be zero.

G. Submit plan for testing to the Engineer for review at least 10 days before starting the test.

H. Peening shall not be used to repair pinhole leaks in welded pipes. Any leakage in welded pipes shall be repaired by appropriate welding techniques.

I. Repair and retest any pipes showing leakage rates greater than that allowed in the criteria above.

3.09 HYDROSTATIC FLUSHING AND TESTING OF FUEL OIL PIPING

A. Flush pipes with water to remove dirt and debris. Remove loose foreign material such as scale, sand, weld spatter particles, and cutting chips from the inside of piping assemblies. Hammer on the outside of steel piping with a nonmarring hammer to aid in freeing weld spatter, scale, and dirt.

B. Perform hydrostatic pressure testing as described previously.

C. After successfully completing the pressure testing, blow out the piping with clean, dry air having a dewpoint of at least -40°F. Circulate the air through the piping system until the exiting air has the same dewpoint as the applied air.

3.10 PRESSURE TESTING OF DOUBLE-WALLED CONTAINMENT PIPING

A. Test the primary pipe as described for buried and above-ground or exposed piping.

B. Test the secondary containment piping by performing a pneumatic test as described above of the annular space between the primary and secondary pipes at a pressure of 5 psi.

3.11 REPETITION OF TEST

A. If the actual leakage exceeds the allowable leakage, locate and correct the faulty work and repeat the test. Restore the work and all damage resulting from the leak and its repair. Eliminate visible leakage.

3.12 BULKHEAD AND TEST FACILITY REMOVAL

A. After a satisfactory test, the Contractor shall remove the testing fluid, remove test bulkheads and other test facilities, and restore the pipe coatings/linings.

END OF SECTION

SECTION 15146
HIGH-DENSITY POLYETHYLENE (HDPE) PIPE

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Description: The Contractor shall provide all materials and incidentals, including piping, molded and ductile iron fittings, flanged adapters, flanged joints, mechanical joint adapters, hardware, and appurtenances for the HDPE piping systems shown on the Drawings and the Drawing Process Flow Identification.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance, and Section 15055, Piping Systems—General.

A. In general, shop drawings and related manufacturer's product certification shall be made in accordance with the General and Special Conditions of the Contract for approval before the manufacturer constructs or fabricates the material. The following items, which require shop drawings, are brought to the Contractor's attention. The list may not include all items for which shop drawing submittals are required to meet the requirements of the project.

1. Detail drawings of all classes of pipe, joints, and fittings.
2. Detail Drawings of all joints, including manufacturer's certified factory and/or laboratory test reports to confirm thrust-restraint capacities and restraining mechanism application.
3. Existing piping connection details.
4. Adapters for connection to mechanical joint valves and ductile iron pipe fittings.

B. Certification and test reports for the materials, manufacturing, and testing of the types of pipe supplied shall be furnished by the HDPE pipe manufacturer for the manufacturer's own products in accordance with the latest standards of the industry as described in this Section.

C. Provide a statement in writing from the HDPE pipe manufacturer that the manufacturer is listed with the Plastic Pipe Institute as a qualified extruder for the polyethylene resin to be used in the manufacture of the pipe for this project.

D. All persons making heat fusion joints shall receive training in the manufacturer's recommended procedures. The Contractor shall maintain records of trained

personnel and certify that training was received not more than 12 months before construction began. Additionally, the Contractor shall have worked on one or more projects involving combined installation of at least 10,000 feet of HDPE butt-fusion-welded pipe and shall provide the Engineer with a written list of HDPE pipeline installation experience, including project location, date, Owner, and personnel assigned and installing on this project.

E. The pipe manufacturer shall certify in writing that the Contractor is qualified to join, lay, and pull the pipe or representative of the pipe manufacturer shall be onsite to oversee all pipe joining. All costs for the manufacturer's representative shall be paid for by the Contractor.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM) Standards

1. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.
2. ASTM D3261—Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
3. ASTM D3350—Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
4. ASTM D4976—Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.
5. ASTM F714—Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter.

B. American Water Works Association (AWWA)

1. AWWA C151/A21.51—Ductile Iron Pipe, Centrifugally Cast, for Water.
2. AWWA C901—Polyethylene (PE) Pressure Pipe and Tubing, 1/2-inch (13 mm) through 3-Inch (76 mm), for Water Service.
3. AWWA C906—Polyethylene (PE) Pressure Pipe and Fittings, 4-Inch through 63-Inch (100 mm through 1,650 mm), for Waterworks.

C. International Organization for Standardization (ISO)

1. ISO 9001—Quality Management Systems – Requirements.

1.04 QUALITY ASSURANCE

A. The pipe and fitting manufacturer(s) shall have an established quality-control program responsible for inspecting incoming and outgoing materials. Incoming polyethylene materials shall be inspected for density, melt flow rated, and contamination. The cell classification properties of the material shall be certified by the supplier and verified by the manufacturer's quality control.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, and Section 15055, Piping Systems—General, for storing and protecting the items specified in this Section.

1.07 TESTING REQUIREMENTS

A. See Section 15144, Pressure Testing of Piping.

1.08 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 PIPE AND FITTINGS

A. General

1. All HDPE shall be DriscoPlex PE4710 (PE3408) HDPE; or approved equal.
2. All HDPE pipe 4 inches in diameter or greater shall have a Ductile Iron Pipe outside diameter, and HDPE pipe 3 inches in diameter and smaller shall be IPS unless otherwise specified or shown in the Drawings.
3. All HDPE piping system components shall be the products of one manufacturer.
4. Pipe and fittings shall be manufactured by an ISO 9001-certified manufacturer.

B. HDPE Pipe

1. HDPE pipe 4 inches in diameter and larger shall conform to material standard ASTM D3350 345434 E cell classification rated as PE4710 (PE3408) by the Plastics Pipe Institute. Minimum pressure rating shall be in accordance with Piping Schedule Drawing or as specified in this Section. Minimum pressure rating for HDPE pipe used at directional drilling crossings shall be 160 psi SDR 11 (Standard Dimension Ratio).
2. The polyethylene compound shall be suitably protected against degradation by ultraviolet light.
3. The maximum allowable hoop stress shall be 800 psi at 73.4ºF.
4. The pipe manufacturer shall be listed with the Plastic Pipe Institute as meeting the requirements of the resin manufacturer to manufacture pipe from the resin used.

C. Fittings

1. The pipe manufacturer shall mold or fabricate the polyethylene fittings. Butt fusion outlets shall be made to the same outside diameter, wall thickness, and tolerances as the mating pipe. All fittings and custom fabrications shall be fully rated for the same internal pressure as the mating pipe.

    a. Molded Fittings: Molded fittings shall be manufactured in accordance with ASTM D3261 and shall be so marked. Each production lot of molded fittings shall be subjected to the test required under ASTM D3261. The manufacturer shall submit samples from each molded fitting production lot to x-ray inspection for voids and shall certify that voids were not found.

        (1) Polyethylene Flange Adapters: Flange adapter shall be made with sufficient throughbore length to be clamped in a butt fusion joining machine without the use of a subend holder. The sealing surface of the flange adapter shall be machined with a series of small v-shaped grooves to restrain the gasket against blow-out. Flange adaptors shall be fitted with ductile-iron backup rings pressure rated equal to or greater than the mating pipe. The Contractor shall provide flat ring-type Viton gaskets with gasket thickness and hardness as recommended by the pipe manufacturer for use with HDPE flanged joints. Provide carbon steel hardware (bolts, nuts, washers, etc.) conforming to ASTM A307, Grade B for use with the flange adapters assemblies in accordance with the pipe manufacturer’s

recommendations. Gaskets shall be made from material suitable for exposure to the liquid within the pipe.

b. Fabricated Fittings: Fabricated fittings shall be made by heat fusion joining specially machined shapes cut from pipe, polyethylene sheet stock, or molded fittings. Fabricated fittings shall be rated for internal pressure service equivalent to the full-service pressure rating of the mating pipe. Pressure de-rated fittings are not acceptable. Directional fittings 16 inches IPS and larger, such as elbows, tees, crosses, etc., shall have a plain end inlet for butt fusion and flanged directional outlets.

2. D.I./HDPE Mechanical Joint Adaptors.

a. The manufacturer of the HDPE pipe shall supply all D.I./HDPE mechanical joint adaptors and accessories required to connect plain-end HDPE piping to mechanical joint fittings, valves, and appurtenances.

b. The D.I./HDPE mechanical joint adaptor shall consist of:

(1) A molded or fabricated HDPE mechanical joint transition fitting.
(2) A Buna-N gasket for a D.I. mechanical joint.
(3) A ductile iron mechanical joint backup drive ring.
(4) Cor-Ten mechanical joint tee bolts.
(5) A stainless-steel sleeve stiffener molded or fabricated within the MJ end of the HDPE mechanical joint adaptor fitting.

c. The D.I./HDPE mechanical joint adaptor shall be connected to the HDPE pipe by a heat-fused joint on one end and connected to a ductile iron pipe valve, fitting, or appurtenance with the internally stiffened mechanical joint end.

d. The tee bolts and backup drive ring shall act as a joint restraint for connections to mechanical joints.

e. The HDPE mechanical joint adaptor fitting shall be molded or fabricated by the manufacturer of the HDPE pipe. All molded fittings shall be fully pressure rated to match the SDR pipe pressure rating. Fabricated fittings shall be rated for internal pressure service equivalent to the full pressure rating of the mated IPS pipe.

f. If rework compounds are required, only those generated in the manufacturer's own plant from resin compounds of the same class and type from the same raw material supplier shall be used.

g. Solvent epoxy cementing and mechanical joining with bolt on wrap-around clamps shall not be used.

3. Ductile-iron fittings connected to SDR 11 HDPE pipe (4 inches and larger) shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.

D. HDPE Pipe Jointing Method

1. HDPE pipe shall be jointed by butt fusion in accordance with the pipe manufacturer's directions and only for pipe within one SDR ratio of each other.
2. For SDR ratios that are two or more apart (i.e., SDR 21 to an SDR 11), the joint shall be made using a restrained joints. Same-diameter pipe may be joined by using HDPE flange adapters and backup rings bolted to each other.
3. All HDPE pipe joined by butt fusion shall be made from the same class and type of raw material made by the same raw material supplier.
4. *Butt fusion* means the butt joining of the pipe by heat fusion aligned faces of the pipe ends (butts) in a suitable apparatus and joining under controlled pressure and alignment.
5. The external bead resulting from the butt-fusion process shall be visible and examined for complete butt-fusion 360^{o} around the pipe exterior.
6. Short spools of pipe between valves and fittings shall be ductile iron pipe, with all joints restrained for sizes 4 inches and larger. For 2-inch, the spool shall be Schedule 40 Type 304 stainless steel piping or Schedule 80 PVC piping with IP threads stainless steel or PVC fittings and all joints restrained.
7. Where approved by the Engineer, the HDPE pipe and fittings may be fused with Electrofusion Couplings, as manufactured by Central Plastics Company, or approved equal. Technical information must be provided to demonstrate that the fused coupling will not compromise the structural integrity of the HDPE pipe.

2.02 LOCATOR WIRE

A. All HDPE piping shall be installed with two insulated 12-gauge minimum AWG solid strand copper wires for location purposes as specified in Section 15055, Piping Systems—General.

PART 3 EXECUTION

3.01 GENERAL

A. All polyethylene pipe shall be cut, fabricated, joined, and installed in strict conformance with the pipe manufacturer's recommendations. Joining, laying, and pulling of polyethylene pipe shall be accomplished by personnel experienced in working with HDPE pipe.

3.02 LAYING PIPE

A. Joints

1. All HDPE to HDPE pipe joints shall be joined by heat fusion that produces homogeneous, sealed, leak-tight joints.
2. Restrained mechanical joint adaptors shall be provided at tie-ins with valves, ductile iron fittings, and other pipe materials.

B. Butt Fusion Testing

1. The Contractor shall test the first fusion of each day.
2. In testing, the fusion shall be allowed to cool completely and then fusion test straps shall be cut out. The test shall be a minimum of 12 inches or 30 times the wall thickness in length with the fusion in the center and a minimum of 1 inch or 1.5 times the wall thickness in width. Bend the test strap until the ends of the strap touch. The Contractor shall not begin until a fusion test has passed the bent strap test.

C. Pipe Deflection

1. When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane or where long radius curves are permitted, the amount of deflection shall not exceed 75% of that recommended by the manufacturer.

D. Pipe Cutting

1. Cutting HDPE butt fusion connections to HDPE pipe, valves, fittings, or closure pieces shall be done in a neat, workman-like manner without damaging the pipe. Ends shall be cut square and perpendicular to the pipe axis.

3.03 PERFORATED HDPE PIPING INSTALLATION (NOT USED)

3.04 FLUSHING AND CLEANING

A. Flushing and Cleaning shall be as specified in Section 15144, Pressure Testing of Piping.

3.05 TESTING AND LEAKAGE

A. Hydrostatic Tests—General

1. All testing shall comply with Section 15144, Pressure Testing of Piping, except as specified in this Section.

2. All field tests shall be made in the presence of the Owner or Engineer. Except as otherwise directed, all pipelines shall be tested. All piping to operate under liquid pressure shall be tested in sections of approved length, typically from valve to valve and in no case longer than 5,000 feet.

3. Hydrostatic testing shall consist of a combined pressure test and leakage test. The field test pressure shall be as indicated on the Drawing Piping Schedule, measured at the lowest point of the section being tested. The pressure shall be applied by a pump connected to the pipe in a manner satisfactory to the Engineer. The pump, pipe connection, and all necessary apparatus shall be furnished by the Contractor and shall be subject to the satisfaction of the Engineer.

4. The maximum duration for any test, including initial pressurization, initial expansion, and time at test pressure, must not exceed 8 hours. If the test is not completed due to leakage, equipment failure, etc., depressurize the test section and allow it to "relax" for at least 8 hours before bringing the test section up to test pressure again.

5. Monitored Make-Up Water Test: The test procedure consists of initial expansion and test phases.

   a. During the initial expansion phase, the test section is filled with water. Once the line is filled, make-up water is added at hourly intervals as required to maintain the test pressure for 3 hours.
   b. At the end of the initial expansion period, the addition of make-up water will cease. During the test phase, the pipe will not have any water added to it for the following 2 hours. The 2 hours will be the actual leakage test. At the end of the 2-hour period, measured make-up water will be added to the pipe to return it to the original test pressure.

c. If the amount of make-up water added is greater than calculated using the numbers listed below, the section being tested will be considered to have a leak. The leak shall be found and fixed at the Contractor's expense and that section of the line retested before continuing with subsequent leakage tests. Testing and repairs shall be repeated at the Contractor's expense until the amount of make-up water is less than the amount calculated using the numbers listed below.

ALLOWABLE FOR EXPANSION UNDER TEST PRESSURE*
POLYETHYLENE PIPE

Nominal Pipe Size (in.)	Allowances for Expansion (US Gal/100 Feet of Pipe)		
	1-Hour Test	2-Hour Test	3-Hour Test
6	0.30	0.60	0.90
12	1.1	2.3	3.4

These allowances only apply to the test phase and not to the initial expansion phase.

END OF SECTION

SECTION 15155
DUCTILE IRON PIPE AND FITTINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. The Contractor shall provide all materials and incidentals, including piping, fittings, flanged joints, mechanical joints, retainer glands, polyethylene bagging for buried ductile iron piping, fittings, valves, and appurtenances for the ductile iron piping systems required for the work shown on the Drawings in the Piping Schedule.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. All ductile iron pipe and fittings to be installed under this Contract shall be inspected and tested at the foundry where the material for this project is manufactured. The Contractor shall submit sworn certificates of such tests and their results.

B. Shop Drawings, including layout drawings, shall be submitted as specified in Section 15055, Piping Systems—General.

C. The Contractor shall submit the pipe manufacturer's certification of compliance with the applicable Sections of the Specifications.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society for Testing and Materials (ASTM)

1. ASTM A193/A193M—Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.

2. ASTM A194/A194M—Standard Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure and High Temperature Service, or Both.
3. ASTM A307—Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 psi Tensile Strength.
4. ASTM A536—Standard Specification for Ductile Iron Castings.
5. ASTM A563—Standard Specification for Carbon and Alloy Steel Nuts.
6. ASTM B117—Standard Practice for Operating Salt Spray (Fog) Apparatus.
7. ASTM C150/C150M—Standard Specification for Portland Cement.
8. ASTM C283—Standard Test Methods for Resistance of Porcelain Enameled Utensils to Boiling Acid.
9. ASTM D714—Standard Test Method for Evaluating Degree of Blistering of Paints.
10. ASTM D792—Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
11. ASTM D1238—Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer.
12. ASTM E96—Standard Test Methods for Water Vapor Transmission of Materials.
13. ASTM G95—Standard Test Method for Cathodic Disbondment Test of Pipeline Coatings (Attached Cell Method).

B. American Society of Mechanical Engineers (ASME)

1. ASME B1.1—Unified Inch Screw Threads (UN and UNR Thread Form).
2. ASME B16.1—Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250.

C. American Water Works Association (AWWA)

1. AWWA C104/A21.4—Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
2. AWWA C110/A21.10—Ductile-Iron and Gray-Iron Fittings.
3. AWWA C111/A21.11—Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
4. AWWA C115/A21.15—Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
5. AWWA C150/A21.50—Thickness Design of Ductile-Iron Pipe.
6. AWWA C151/A21.51—Ductile-Iron Pipe, Centrifugally Cast.
7. AWWA C153/A21.53—Ductile-Iron Compact Fittings.
8. AWWA C207—Steel Pipe Flanges for Waterworks Service Sizes, 4-Inch through 144-Inch (100 mm through 3,600 mm).

9. AWWA C600—Installation of Ductile-Iron Mains and their Appurtenances.
10. AWWA C651—Disinfecting Water Mains.

D. International Organization for Standardization (ISO)

1. ISO 9001—Quality Management Systems – Requirements.

E. NSF International (NSF)

1. NSF 61—Drinking Water System Components – Health Effects.

1.04 QUALITY ASSURANCE

A. Source Quality Control

1. The ductile iron pipe manufacturer shall submit certification that the pipe and fitting products meet all tests required by AWWA C151/A21.51.
2. All materials shall be new and have a manufacturer's certificate verifying compliance to all tests and inspections as required in this Section. The weight, class, and casting period shall be shown on each piece of pipe. The manufacturer's "mark," the year produced, and the word "Ductile" or the letters "DI" shall be cast or stamped on all pipe.

1.05 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.06 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.07 TESTING REQUIREMENTS

A. See Section 15144, Pressure Testing of Piping, for testing requirements.

1.08 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 GENERAL

A. All ductile iron piping shall be designed and manufactured in accordance with AWWA C150/A21.50 and AWWA C151/A21.51 for the following minimum operating conditions:

1. The minimum internal design pressure shall be 150 psi with a 100-psi surge allowance, with a safety factor of 2, for a total internal design pressure of 500 psi.

2. The external loads design criteria shall be for the minimum cover indicated on the Drawings at 120 lb per cubic feet soil weight and live load based on one AASHTO H-20 truck load. The thickness design of ductile iron pipe shall be in accordance with AWWA C150/A21.50.

3. The horizontal deflection of cement-mortar-lined ductile iron pipe resulting from external load conditions shall not exceed 3% of the pipe diameter based on the trench design shown on the Drawings.

4. Pressure Class: All ductile iron piping shall meet the following minimum working pressure classes:

   a. 4 inches through 12 inches: 350 psi.
   b. Pipe greater than 12 inches: 250 psi.

2.02 JOINTS

A. Ductile iron fittings shall be furnished with mechanical joints and flanged joint ends as shown on the Drawings and specified in this Section:

1. Mechanical Joints: All buried ductile iron fittings shall be furnished with mechanical joint ends unless noted otherwise. Mechanical joints shall conform to AWWA C111/A21.11. Glands shall be constructed of ductile iron.
2. Flanged Joints: Pipe for threaded flange fabrication shall be Special Thickness Class 53 in accordance with AWWA C110/A21.10, AWWA C111/A21.11, and AWWA C115/A21.15. Bolt circle and bolt holes shall match those of ASME B16.1 Class 125 flanges. The flanges shall be rated for a maximum working pressure of 250 psi. Threaded flanges shall be individually fitted and machine tightened on the pipe ends. Flange facing shall be smooth or with shallow serrations in accordance with AWWA C115/A21.15.

2.03 FITTINGS

A. General: Ductile iron pipe fittings shall be the compact type meeting the requirements of AWWA C110/A21.10 and AWWA C153/A21.53 where applicable. Ductile iron fittings shall be cement lined and seal coated or epoxy lined. Lining of fitting shall conform to lining specified for piping and service as specified on the Drawing, Flow Stream Identification. Fittings shall be manufactured in accordance with AWWA C110/A21.10. Where taps are shown on fittings, tapping bosses shall be provided. At a minimum, fittings shall have the same pressure rating as the connecting pipe.

1. Flanged Joint: AWWA C110/21.10 and ASME B16.1, faced and drilled 125-pound ANSI standard.

2. Mechanical Joint: AWWA C110/A21.10.

   a. Provide mechanical joint fittings for all buried fittings as shown in the Drawings, unless noted otherwise.
   b. Provide specified gaskets.

2.04 LINING AND COATING

A. The Contractor shall provide lined ductile iron piping and fittings in accordance with the Drawing, Flow Stream Identification. The Contractor shall perform all field measurements confirming the accuracy of the piping sizes and lengths shown on the Drawings. The Contractor shall notify the Engineer immediately before deviating from or altering the lining of ductile iron piping shown on the approved layout schedule.

B. Ceramic Epoxy Lined Pipe and Fittings: The Contractor shall notify the Engineer immediately before cutting epoxy-lined ductile iron pipe in the field. The Contractor shall repair the cut end in accordance with the pipe manufacturer's written procedures.

1. General: The lining shall be an amine-cured novalac epoxy containing at least 20% by volume of ceramic quartz pigment. The lining material shall be Protecto 401 Ceramic Epoxy as manufactured by Induron Protective Coatings, Inc. The lining shall be applied by a competent pipe lining specialty firm with a successful history of applying linings to the interior of ductile iron pipe and fittings.

2. Lining Materials: Lining material shall meet the following requirements and properties:

a. A permeability rating of 0.00 when tested according to Method A of ASTM E96, Procedure A with a test duration of 30 days.

b. The following test shall be run on coupons from lined ductile pipe:

Test Parameter	ASTM Test Method	Typical Value
Salt Spray	B117	0.0 undercutting after 2 years
Cathodic disbondment 1.5 volts @ 77° F	G95	No more than 0.5 mm undercutting after 30 days
Immersion	D714	No effect after 2 years for 20% sulfuric acid, 140°F 25% sodium hydroxide, 160°F distilled water
Immersion	D714	0.0 undercutting after 2 years for 120°F tap water

3. Application: The lining applicator shall apply lining according to the requirements of the Protecto 401 Specification and application methods and procedures.

C. Cement-Lined Ductile Iron Pipe and Fittings: Interior surfaces of all cement-lined ductile iron pipe, fittings, and specials shall be cleaned and lined in the shop with a standard thickness cement-mortar lining applied in conformity with AWWA C104/A21.4, Portland cement mortar. Every precaution shall be taken to prevent damage to the lining. If lining is damaged or found faulty at delivery site, the Contractor shall repair or replace damaged or unsatisfactory portions with lining conforming to these Specifications at no additional cost to the Owner. Pipe linings for potable water lines shall be NSF 61 approved.

1. All ductile iron pipe and fittings cement-mortar linings shall be surface sealed with an asphaltic seal coating, 1 mil, in accordance with AWWA C104/A21.4.

2.05 MANUFACTURERS

A. Acceptable ductile iron pipe manufacturers include US Pipe, American Ductile Pipe, Griffin Pipe, or approved equal.

2.06 BOLTS

A. General: The Contractor shall provide carbon steel, ASTM A307, Grade A hex head bolts and ASTM A563, Grade A hex head nuts. Threads shall be as specified

in ASME B1.1 coarse thread series, Class 2A external and Class 2B internal. Nuts, bolts, and gaskets for flanged fittings and blind flanges shall be designed to withstand the design and test pressure ratings for the pipe.

2.07 GASKETS

A. Gaskets for mechanical joints shall be compatible with potable water or sewage pipe service. See Section 15055, Piping System—General, for gasket requirements.

B. Gaskets for flanged joints shall be 1/8-inch-thick, cloth-inserted rubber conforming to applicable parts of ASME B16.21 and AWWA C207. Gasket material shall be free from corrosive alkali or acid ingredients and suitable for use in sewage and reclaimed water lines. Gaskets shall be full-face type for 125-pound flanges.

2.08 RETAINER GLANDS

A. Retainer glands shall be provided for all buried ductile-iron mechanical joints, fitting, and ductile-iron pipe connections to buried valves. Retainer glands shall be designed for joint retaining through the use of a follower gland and set screw-anchoring devices that impart multiple wedging action against the pipe. The mechanical joint-restraint device shall be UL listed and shall have a working pressure of at least 250 psi with a minimum safety factor of 2.

1. Gland: Manufactured of ductile iron conforming to ASTM A536. Gland dimensions shall match AWWA C111/A21.11 and AWWA C153/A21.53.

2. Restraining Devices: Manufactured of ductile iron heat treated to a minimum hardness of 370 BHN. Restraining devices shall incorporate a set screw/twist-off nut bolt to ensure the proper actuating of the restraining device. The twist-off nut shall be designed to come off at the torque limit desired to anchor the restraining device in place on the pipe.

3. Joint Deflection: Retainer gland joint deflection shall be limited to manufacturer's recommended maximum deflection angle. Joint deflection shall be applied before the set screws are torqued.

4. Acceptable Manufacturers:

    a. EBAA Iron, Inc. – Megalug 1100 Series.
    b. Or approved equal.

2.09 EXTERNAL PIPE RESTRAINTS

A. Ductile iron pipe push-on (bell and spigot) joint restraint shall be provided by a restraining harness consisting of a restraint ring, connecting tie-rods, and split-ring assembly installed at all push-on joints. The restraint ring shall consist of wedging components made from 60-42-12 ductile iron conforming to ASTM A536 and wedges heat treated to minimum 370 BHN. Torque limiting twist-off nuts shall be provided on each wedge to ensure proper applied installation torque. The split ring shall be made from 60-42-12 ductile iron conforming to ASTM A536. The connecting rods shall be made of steel conforming to AWWA C111/A12.11. Sizes 4- to 16-inch-diameter restraining harnesses shall have 350-psi maximum working pressure rating and 18- to 36-inch-diameter restraining harnesses shall have 250-psi maximum working pressure rating. All harnesses shall be designed with a 2-to-1 safety factor applied to the maximum working pressure rating.

B. Acceptable Manufacturers

1. EBAA Iron, Inc. – Series 1700.
2. Or approved equal.

2.10 INTERNAL PIPE RESTRAINT

A. Acceptable Manufacturers

1. American Ductile Iron Pipe:

a. Fast Grip ® Gasket.
b. Flex Ring ® Joint.

2. US Pipe

a. Field Lok ® Gasket.
b. TR Flex Restrained Joint Pipe and Fittings.

3. Or Engineer-approved equal.

2.11 POLYETHYLENE BAGGING

A. Polyethylene bagging for buried ductile iron pipe, fittings, and valves shall be 8 mils thickness minimum polyethylene, manufactured in accordance with ASTM D1238, Type I, Class C, Grade E1.

2.12 COLOR CODING OR MARKING

A. All potable water main pipe, including fittings, shall be color coded or marked using blue as a predominant color to differentiate drinking water from reclaimed or other water. Underground plastic pipe shall be solid-wall blue pipe, shall have a co-extruded blue external skin, or shall be white or black pipe with blue stripes incorporated into or applied to the pipe wall; and underground metal or concrete pipe shall have blue stripes applied to the pipe wall. Pipe striped during manufacturing of the pipe shall have continuous stripes that run parallel to the axis of the pipe, that are located at no greater than 90° intervals around the pipe, and that will remain intact during and after installation of the pipe. If tape or paint is used to stripe pipe during installation of the pipe, the tape or paint shall be applied in a continuous line that runs parallel to the axis of the pipe and that is located along the top of the pipe; for pipes with an internal diameter of 24 inches or greater, tape or paint shall be applied in continuous lines along each side of the pipe as well as along the top of the pipe. Marking tape shall be 3 inches wide with adhesive backing. Paint stripe shall be 3 inches wide. Aboveground pipe at drinking water treatment plants shall be color coded and labeled in accordance with subsection 62-555-320(10), FAC, and all other aboveground pipe shall be painted blue or shall be color coded or marked like underground pipe.

B. All reclaimed water valves and outlets shall be appropriately tagged or labeled bearing the words in English and Spanish. All piping, pipelines, valves, and outlets shall be color coded or otherwise marked to differentiate reclaimed water from domestic or other water. Underground ductile iron pipe shall be color coded or marked using purple as a predominant color. If tape is used to mark the pipe, the tape shall be permanently affixed to the top and each side of the pipe (three locations parallel to the axis of the pipe). For pipes less than 24 inches in diameter, a single tape may be used along the top of the pipe. Visible, aboveground portions of the reclaimed water distribution system shall be clearly color coded or marked.

PART 3 EXECUTION

3.01 HANDLING PIPE AND FITTINGS

A. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe, fitting, lining, and coating. Pipe and fittings shall not be dropped. All pipe and fittings shall be examined before installation, and no piece that the Engineer finds defective shall be installed. The Contractor shall repair any damage to the pipe and fittings coating and/or lining as directed by the Engineer. If the Engineer determines that the coating and/or lining cannot be repaired, the Contractor shall replace the damaged pipe and fittings at no additional compensation.

B. All pipe and fittings shall be subjected to a careful inspection immediately before installation.

C. If any defective pipe is discovered after it has been installed, the Contractor shall remove and replace it with a pipe in satisfactory condition at no additional expense to the Owner.

D. Ceramic epoxy and glass-lined pipe and fittings shall be handled only from the outside of the pipe and fittings. No forks, chains, straps, hooks, etc. shall be placed inside the pipe and fittings for lifting, positioning, or laying.

3.02 PIPE INSTALLATION

A. The Contractor shall provide and use proper implements, tools, and facilities for the safe and convenient performance of the work. All pipe, fittings, valves, and appurtenances shall be lowered carefully into the trench and at above-grade locations to prevent damage to the pipe, protective coating, lining, and polyethylene bagging. Under no circumstances shall pipeline materials be dropped off or dumped. A trench shall be dewatered before the pipe is installed.

B. The Contractor shall carefully examine all pipe fittings, valves, and other appurtenances for damage and other defects immediately before installation and before bagging buried ductile-iron pipe. The Contractor shall mark and hold defective materials for inspection by the Engineer, who may prescribe corrective repairs or reject the materials.

C. The Contractor shall remove all lumps, blisters, and excess coating from the socket and plain ends of push-on joint pipe for buried service. The outside of the plain end and the inside of the bell shall be wiped clean and dry and be free from dirt, sand, grit, or any foreign material before the pipe is laid in trench.

D. The Contractor shall prevent foreign material from entering the pipe while the pipe is being placed in the trench. During installation, no debris, tools, clothing, or other materials shall be placed in the pipe.

E. As each length of buried pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.

F. When pipe is not being laid, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer. When practical, the plug shall remain in place until the trench is pumped completely dry. Care shall be taken to prevent pipe flotation should the trench fill with water.

G. Trench width at the top of pipe, bedding conditions, and backfill placement and compaction shall be such that design loadings on the pipe will not be exceeded.

H. Joint Assembly: Pipe joints shall be assembled in accordance with the manufacturer's instructions and the requirements of AWWA C600.

1. Flanged Joint: Before connecting flanged pipe the Contractor shall thoroughly clean all faces of the flanges of all oil, grease, and foreign material. The rubber gaskets shall be checked for proper fit and thoroughly cleaned. Care shall be taken to ensure proper sealing of the flange gasket. Bolts shall be tightened so that the pressure on the gasket is uniform. Torque-limiting wrenches shall be used to ensure uniform bearing insofar as possible. If joints leak when the hydrostatic test is applied, the gaskets shall be removed and reset and bolts retightened.
2. Push-On, Restrained Joint, or Mechanical Joint: The Contractor shall joint piping in accordance with the manufacturer's recommendations. Provide all special tools and devices, such as special jacks, chokers, and similar items required for proper installation. Lubricant for the pipe gaskets shall be furnished by the pipe manufacturer, and no substitutes will be permitted under any circumstance.

I. Pipe Deflection: When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane or where long radius curves are permitted, the amount of deflection shall not exceed that shown in AWWA C600 and that recommended by the retainer gland manufacturer for mechanical joint pipe and fittings.

J. Pipe Cutting: For inserting valves, fittings, or closure pieces pipe shall be cut in a neat, workmanlike manner without damaging the pipe or lining. Ductile cast iron may be cut using an abrasive pipe saw, rotary wheel cutter, guillotine pipe saw, milling wheel saw, or oxyacetylene torch. Cut ends and rough edges shall be ground smooth, and for push-on joint connections the cut end shall be beveled.

3.03 ABOVE-GROUND PIPE INSTALLATION

A. The Contractor shall install pipe in horizontal or vertical planes, parallel or perpendicular to building surfaces unless otherwise shown. Support pipe and fittings to prevent strain on joints, valves, and equipment. Install flanged joints so that contact faces bear uniformly on the gasket. Tighten bolts in accordance with the pipe manufacturer's recommendations.

3.04 SURFACE PREPARATION AND PAINTING

A. All exposed pipe and fittings shall be painted as specified in Section 09900, Painting and Coating.

B. All buried steel bolts, nuts, washers, rods, harnesses, clamps, sleeves, and appurtenances shall be painted with System No. 21 as specified in Section 09900, Painting and Coating.

3.05 INSPECTION, TESTING, AND DISINFECTION

A. See Section 15055, Piping Systems—General; Section 15141, Disinfection of Piping and Water Storage Facilities; and Section 15144, Pressure Testing of Piping.

END OF SECTION

SECTION 15291
POLYVINYL CHLORIDE (PVC) PRESSURE PIPE AND FITTINGS

PART 1 GENERAL

1.01 SCOPE OF WORK

A. This Section covers the work necessary to furnish, install, and complete the AWWA C900 DR 18 PVC pipe and ductile iron fittings specified.

1.02 SUBMITTALS

The Contractor shall submit shop drawings in accordance with Section 01330, Submittals and Acceptance:

A. All PVC pipe and fittings to be installed under this Contract shall be inspected and tested at the location where the material for this project is manufactured. The Contract shall submit certificates of such tests and their results.

B. The Contractor shall submit the pipe manufacturer's certification of compliance with the applicable sections of the Specifications.

1.03 REFERENCE STANDARDS

Reference standards and recommended practices referred to in this Section shall be the latest revision of any such document in effect at the bid time. The following documents are a part of this Section. Where this Section differs from these documents, the requirements of this Section shall apply.

A. American Society of Testing Materials (ASTM)

1. ASTM A242/A242M—Standard Specification for High-Strength Low-Alloy Structural Steel.
2. ASTM A536—Standard Specification for Ductile Iron Castings.
3. ASTM D2241—Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
4. ASTM F477—Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

B. American Water Works Association (AWWA)

1. AWWA C900—Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4-Inch to 12-Inch (100 mm to 300 mm), for Water Transmission and Distribution.
2. AWWA C905—Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14-Inch through 48-Inch (350 mm through 1,200 mm) for Water Transmission and Distribution.

1.04 WARRANTIES

A. Warranties shall be in accordance with General Conditions, Supplementary Conditions, and Section 01780, Warranties and Bonds.

1.05 DELIVERY, STORAGE, AND HANDLING

A. The Contractor shall adhere to the requirements specified in Section 01650, Delivery, Storage, and Handling, for storing and protecting the items specified in this Section.

1.06 OPERATIONS AND MAINTENANCE (O&M) MANUALS

A. O&M Manuals shall be in accordance with General Conditions, Supplementary Conditions, and Section 01830, Operations and Maintenance Manuals.

PART 2 PRODUCTS

2.01 LARGE PVC PRESSURE PIPE

A. Large PVC Pressure Piping

1. Unless otherwise noted, PVC pressure pipe for nominal diameters 4 inches and larger shall conform to the requirements of AWWA C900 DR 18 up to 12 inches with gasketed integral bell ends. Pipe shall be designed for maximum working pressure of not less than 150 psi. Pipe shall be made to ductile iron pipe ODs instead of IPS. The PVC pipe shall be blue and NSF approved for potable water use and green for sewer main use.

B. Bell and Spigot

1. Pipe joints shall be made with integral bell and spigot pipe ends. The bell shall consist of an integral thickened wall section designed to be at least as strong as the pipe wall. The bell shall be supplied with a factory glued rubber ring gasket that conforms to the manufacturer's standard

dimensions and tolerances. The gasket shall meet the requirements of ASTM F477 "Elastomeric Seals (Gaskets) for Joining Plastic Pipe." PVC joints shall be "Ring-Tite" as manufactured by J-M Manufacturing Company, Inc. or an equal approved by the Engineer. Nontoxic gasket lubricant shall be as specified by the pipe manufacturer.

C. Restrained Joints

1. The following pipe joints and fittings restraint methods can be used to prevent pipe joints and fittings from separating under pressure. No additional financial compensation will be provided to the Contractor for providing the following methods of restraint:

a. C-900 PVC pipe bell and spigot joints (4-inch- through 12-inch-diameter pipe) shall be restrained with the EBAA Iron MEGALUG® Series 1600 Restrainer or an equal approved by the Engineer. The Series 1600 restrainers shall provide a minimum of 150-psi restraint to DR 18 (Class 150) pipe with a 3 to 1 safety factor. The restraining device and tee head bolts shall be manufactured of high-strength ductile iron meeting ASTM A536, Grade 65-42-10. Clamping bolts and nuts shall be manufactured of corrosion-resistant, high-strength, low-alloy CORTEN steel meeting the requirements of ASTM A242/A242M.

b. Mechanical joint fittings used with PVC pipe (3-inch- through 36-inch-diameter DR 18 pipe) shall be restrained with the EBAA Iron MEGALUG® Series 2000 PV Restrainer or an equal approved by the Engineer. The Series 2000 PV restrainers shall provide a minimum of 150-psi restraint with a 2 to 1 safety factor. The restraining device and Tee head bolts shall be manufactured of high-strength ductile iron meeting ASTM A536, Grade 65-42-10. Clamping bolts and nuts shall be manufactured of corrosion-resistant, high-strength, low-alloy CORTEN steel meeting the requirements of ASTM A242/A242M.

c. All parts of the joint restraint systems shall be coated with coal tar epoxy as in Section 09900, Painting and Coating, Mega-Bond coating system by EBAA Iron, Inc. or Engineer-approved equal.

2.02 LARGE PVC PRESSURE PIPE FITTINGS

A. Fittings for use with large PVC pipe shall be ductile-iron fittings conforming to the requirements of mechanical joint fittings as specified in Section 15155, Ductile Iron Pipe and Fittings.

B. Exterior Coating

1. Exterior coating for fittings shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.

C. Lining

1. Lining for fittings shall be as specified in Section 15155, Ductile Iron Pipe and Fittings.
2. Any damaged lined areas shall be repaired in accordance with the manufacturer's recommendations so that the repaired area is equal to the undamaged lined areas.

2.03 SMALL PVC PRESSURE PIPE (NOT USED)

PART 3 EXECUTION

3.01 EXAMINATION

A. The Contractor shall examine pipe and appurtenances shall be examined at the point of delivery. Material found to be defective due to manufacture or damage in shipment shall be rejected. Tests as specified in the applicable material standard may be performed to ensure conformance with the standard.

3.02 PIPE INSTALLATION

A. Proper implements, tools, and facilities shall be provided and used for the safe and convenient performance of the work. All pipe, fittings, and valves shall be lowered carefully into the trench using suitable tools or equipment to prevent damage to pipeline materials. Under no circumstances shall pipeline materials be dropped or dumped into the trench. The trench shall be dewatered before installing the pipe in accordance with the Specifications.

B. The sealing surface of the pipe, the inside of the bell, and the inside of the gasket shall be cleaned immediately before assembly.

C. Foreign material shall be prevented from entering the pipe while it is being placed in the trench. During laying operations, no debris, tools, clothing, or other materials shall be placed in the pipe.

D. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.

E. At all times when pipe laying is in progress, except when joining another piece of pipe, the open ends of the pipe shall be closed by a watertight plug or other means approved by the Engineer to prevent the entrance of objectionable materials. Care shall be taken to prevent pipe flotation.

F. Trench width at the top of the pipe, bedding conditions, and backfill placement and compaction shall be in accordance with the Contract Documents.

G. Joint Assembly

1. Pipe joints shall be assembled in accordance with the manufacturer's instructions.

H. Pipe Deflection

1. When it is necessary to deflect pipe from a straight line in either the vertical or horizontal plane, the amount of deflecting shall not exceed 75% of that recommended by the manufacturer.

I. Pipe Cutting

1. Cutting pipe for the insertion of valves, fittings, or closure pieces shall be done in a neat, workman-like manner without creating damage to the pipe. Ends shall be cut square and perpendicular to the pipe axis.
2. Burrs shall be removed from spigots, and ends shall be smoothly beveled. Field cut ends shall be marked for proper depth of joint assembly.

J. Thrust Restraint

1. All pipe, tees, valves, bends, and etc., unless otherwise specified, shall be restrained using mechanical means as specified. Pipe restraint using the specified mechanical restraining system with the restrained joint schedule or tie-rods is also acceptable. Reaction blocking shall not be used on this project.
2. All ductile iron fittings, valves, mechanical restraint harnesses, and other forms of mechanical restraint shall be installed and wrapped in polyethylene tube material as specified in Section 15155, Ductile Iron Pipe and Fittings.

3.03 LOCATION AND IDENTIFICATION

A. All non-metallic potable water and sewer mains shall be installed with a continuous, insulated 14-gauge copper wire installed directly on top of pipe for

location purposes. Detectable tape may be used in lieu of copper wire and shall be placed 1 foot above the top of the pipe.

B. All PVC sewer mains shall be a solid green color. All potable water mains shall be a solid blue color. All lettering shall appear legibly on pipe and shall run the entire length of the pipe. Lettering shall be appropriate for the intended use.

3.04 TESTING

A. All lines shall be tested at the pressures listed in the Piping Schedule in the Drawings.

B. See Section 15144, Pressure Testing of Piping, for the requirements of pipe flushing, cleaning, pressure and leakage testing, and inspection requirements.

C. See Section 15141, Disinfection of Piping and Water Storage Facilities, for the disinfection requirements.

END OF SECTION

APPENDIX A

REPORT OF A GEOTECHNICAL EXPLORATION

Engineering & Consulting, Inc.

SUMMARY REPORT OF A GEOTECHNICAL SITE EXPLORATION

SOUTH 301 W WATER AND WASTEWATER PIPELINES ZEPHYRHILLS, PASCO COUNTY, FLORIDA

GSE PROJECT NO. 16198

Prepared For:

JONES EDMUNDS & ASSOCIATES, INC.

SEPTEMBER 2023

GSE Engineering & Consulting, Inc.

September 8, 2023

Keyla Virgilio, E.I.
Jones Edmunds & Associates, Inc.
730 NE Waldo Road
Gainesville, Florida 32641

Subject: Summary Report of a Geotechnical Site Exploration
South 301 W Water and Wastewater Pipelines
Zephyrhills, Pasco County, Florida
GSE Project No. 16198

GSE Engineering & Consulting, Inc. (GSE) is pleased to submit this geotechnical site exploration report for the above referenced project.

Presented herein are the findings and conclusions of our exploration, including the geotechnical parameters and recommendations to assist with the force main and water main designs.

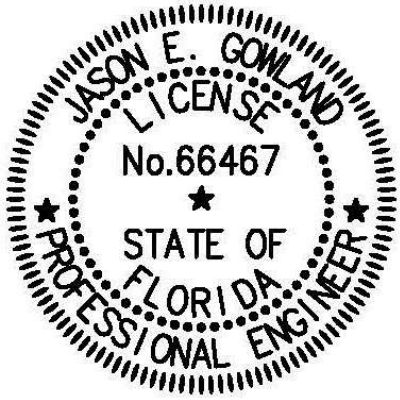
GSE appreciates this opportunity to have assisted you on this project. If you have any questions or comments concerning this report, please contact us.

Sincerely,

GSE Engineering & Consulting, Inc.



Kevin P. Fisher, E.I.
Staff Engineer



This item has been digitally signed and sealed by

on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Jason E. Gowland, P.E.
Principal Engineer
Florida Registration No. 66467

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1. Project Site Location Map

2A. Partial Site Plan Showing Approximate Locations of Field Tests

2B. Partial Site Plan Showing Approximate Locations of Field Tests

1.0 INTRODUCTION

1.1 General

GSE Engineering & Consulting, Inc. (GSE) has completed this geotechnical exploration for the proposed South 301 W Water and Wastewater Pipeline project located in Zephyrhills, Pasco County, Florida. This exploration was performed in accordance with GSE Proposal No. 2023-438 dated July 11, 2023. You authorized our services on July 26, 2023.

1.2 Project Description

This project will consist of a new force main and water main on Gall Boulevard and Tucker Road. You provided information about the project including site plans illustrating the proposed force main alignment and requested soil boring locations.

A proposed 6-inch diameter force main will be installed using horizontal direction drill (HDD) methods. The force main will be located in the western road right-of-way of Gall Boulevard and southern right-of-way of Tucker Road. The 12-inch water main will be constructed in an open trench. The water main will be located in the east Gall Boulevard right-of-way and the northern Tucker Road right-of-way.

A recent aerial photograph of the site was obtained. The site plan and aerial photograph were used in preparation of this exploration and report.

1.3 Purpose

The purpose of this geotechnical exploration was to determine the general subsurface conditions, evaluate these conditions with respect to the proposed construction, and prepare geotechnical parameters and recommendations to assist with the force main and water main designs.

2.0 FIELD AND LABORATORY TESTS

2.1 General Description

The procedures used for field sampling and testing are in general accordance with industry standards of care and established geotechnical engineering practices for this geographic region. This exploration consisted of performing nineteen (19) Standard Penetration Test (SPT) borings to depths of 10 to 20 feet below land surface (bls) along the force main and water main alignments.

The soil borings were performed at the approximate locations as shown on Figures 2A & 2B. The borings were located at the site using the provided site plan and obvious site features as reference. The boring locations should be considered approximate. The soil borings were performed from August 21 through 24, 2023.

2.2 Standard Penetration Test Borings

The soil borings were performed with a drill rig employing flight auger drilling techniques and Standard Penetration Testing (SPT) in accordance with ASTM D1586. The SPTs were performed continuously to 10 feet and at 5-foot intervals thereafter. Soil samples were obtained at the depths where the SPTs were performed. The soil samples were classified in the field, placed in sealed containers, and returned to our laboratory for further evaluation.

After drilling to the sampling depth, the standard two-inch O.D. split-barrel sampler was seated by driving it 6 inches into the undisturbed soil. Then the sampler was driven an additional 12 inches by blows of a 140-pound hammer falling 30 inches. The number of blows required to produce the next 12 inches of penetration were recorded as the penetration resistance (N-value). These values and the complete SPT boring logs are provided in Section 5.1.

Upon completion of the sampling, the boreholes were abandoned in accordance with Water Management District guidelines.

2.3 Soil Laboratory Tests

The soil samples recovered from the soil borings were returned to our laboratory, and examined to confirm the field descriptions. Representative samples were then selected for laboratory testing. The laboratory tests consisted of six (6) percent soil fines passing the No. 200 sieve determinations, six (6) natural moisture content determinations, and two (2) corrosion series tests. These tests were performed in order to aid in classifying the soils and to further evaluate their engineering properties. The laboratory tests are provided in Section 5.2.

3.0 FINDINGS

3.1 Surface Conditions

Mr. Kevin P. Fisher, E.I. with GSE visited the site on August 2, 2023 to observe the site conditions and mark the boring locations. Mr. Fisher returned to the site on August 17, 2023 to re-mark several boring locations where the stakes went missing.

The force main will be located in the western road right-of-way of Gall Boulevard and southern right-of-way of Tucker Road. The water main will be located in the east Gall Boulevard right-of-way and the northern Tucker Road right-of-way.

The topography at the site is moderately sloping up towards the north from the south. Regional topography is rolling hills. The provided site plans indicate the ground surface elevations across the site are near elevations 77.5 to 85.5 feet[1].

3.2 Subsurface Conditions

The locations of the SPT borings are provided on Figures 2A & 2B. Complete logs for the borings are provided in Section 5.1. Descriptions for the soils encountered are accompanied by the Unified Soil Classification System symbol (SM, SP-SM, etc.) and are based on visual examination of the recovered soil samples and the laboratory tests performed. Stratification boundaries between the soil types should be considered approximate, as the actual transition between soil types may be gradual.

The SPT borings located along the proposed force main indicate the soils across these areas are relatively consistent. The auger borings initially penetrated 6 to 10 feet of a near-surface sandy stratum consisting of poorly graded sand, sand with silt, and silty sand (SP, SP-SM, SM). This was underlain by clayey to very clayey sand (SC, SC/CL) and clay-rich soils consisting of sandy clay and clay (CL/CH) to the explored depths of 10 to 20 feet bls in SPT borings A-9, A-11, A-13, A-15, A-16, A-17, A-18, and A-19.

The SPT borings located along the proposed water main indicate the soils across these areas are relatively consistent. The auger borings initially penetrated 8 to 10 feet of a near-surface sandy stratum consisting of poorly graded sand, sand with silt, and silty sand (SP, SP-SM, SM). This was underlain by clay-rich soils consisting of sandy clay and clay (CL/CH) to the explored depths of 10 feet bls in SPT borings A-12 and A-14.

The poorly graded sand, sand with silt, and silty sand (SP, SP-SM, SM) is generally in a very loose to medium dense condition with N-values ranging from 4 to 12 blows per foot. The underlying clayey to very clayey sand (SC, SC/CL) is generally in a loose condition with N-values ranging from 7 to 10 blows per foot. The underlying clay-rich soils (CL/CH) are generally in a firm to stiff condition with N-values ranging from 7 to 14 blows per foot.

The groundwater table was encountered in the SPT borings A-10, A-11 A-12, A-15, A-16, and A-18 at a depth of 8 feet bls at the time of our investigation.

[1] South 301 W – Water and Wastewater Pipelines, Forcemain Plans, Jones Edmunds Project No. 26110-051-01, June 2023

3.3 Review of Published Data

The majority of the site is mapped as three soil series by the Soil Conservation Service (SCS) Soil Survey for Pasco County[2]. The following soil descriptions are from the Soil Survey.

Tavares sand, 0 to 5 percent slopes - This nearly level to gently sloping, moderately well drained soil is on low ridges and knolls throughout the county. Areas are irregular in shape.

The soil is sand to a depth of 80 inches or more.

Typically, the surface later is very dark gray sand about 3 inches thick. Below this, layers of yellowish brown and light yellowish-brown sand extend to a depth of 56 inches. Below this is a layer of very pale brown sand 20 inches thick, and below this, white sand extends to a depth of 80 inches or more.

Included with this soil in mapping are small areas of Adamsville, Astatula, and Candler soils. Also included are small areas of Millhopper and Sparr soils and, along rivers, a few areas of soils that occasionally are flooded. The included soils make up about 10 percent of the map unit.

In most years, under natural conditions, the water table is at a depth of 40 to 60 inches for 6 to 12 months and below 60 inches during very dry periods. The available water capacity is very low. Permeability is very rapid. Natural fertility is low.

Tavares-Urban land complex, 0 to 5 percent slopes - This map unit consists of areas of Urban land and nearly level to gently sloping, moderately well drained Tavares soils on low ridges. Tavares soils make up 45 to 65 percent of the map unit, and Urban land makes up from 30 to 45 percent. The areas of Tavares soils and Urban land are so intricately mixed, or so small, that it is not practical to separate them in mapping at the scale used.

Tavares soils are sand to a depth of 80 inches or more. Typically, the surface layer is very dark gray and is about 3 inches thick. Beneath the surface layer the sand is yellowish brown and light yellowish brown to a depth of 56 inches, very pale brown to between depths of 56 and 76 inches, and white between depths of 76 and 80 inches or more. In some places, the soil has been radically altered. Some of the low areas have been filled or leveled during construction, and other small areas have been cut, built up, or smoothed.

Urban land is covered by streets, parking lots, buildings, and other structures that so obscure or alter the soils that identification is not feasible.

Included in mapping, and making up 5 to 15 percent of the unit, are small areas of Adamsville and Astatula soils. The somewhat poorly drained Adamsville soils are in the slightly lower and wetter areas. The excessively drained Astatula soils are in higher, convex areas of the landscape.

Most areas of this map unit are artificially drained by sewer systems, surface ditches, and canals. Tavares soils that are not drained have a water table at a depth of 40 to 60 inches for 6 to 10 months in most years. Permeability is very rapid throughout the Tavares soils, and natural fertility is low. The available water capacity is very low. Reaction ranges from strongly acid to medium acid throughout the soil.

[2] Soil Survey of Pasco County, Florida. Soil Conservation Service, U.S. Department of Agriculture.

Millhopper fine sand, 0 to 5 percent slopes - This nearly level to gently sloping, moderately well drained soil is on uplands. Individual areas are irregular in shape. Slopes are smooth to concave.

Typically, the surface layer is fine sand 7 inches thick. It is dark gray in the upper 3 inches and grayish brown below. The subsurface layer is fine sand and extends to a depth of about 59 inches. It is very pale brown to a depth of 42 inches and then changes to light yellowish brown. Below this, and extending to a depth of 80 inches or more, is the subsoil. It is yellowish brown fine sandy loam in the upper 5 inches and gray sandy clay loam below.

Included with this soil in mapping are similar soils on similar landscape positions. They differ slightly by containing more very fine sand in the surface and subsurface layers. Small areas of these soils are in several parts of the county, but are concentrated in the north-central part. Also included in mapping are small areas of Arredondo, Candler, Kendrick, Nobleton, Sparr, and Tavares soils. The included soils make up about 15 percent of the map unit.

In an unaltered state, this soil has a water table perched above the loamy horizon. The water is at a depth of 40 to 60 inches for 1 to 4 months and at a depth of 60 to 72 inches for 2 to 4 months in most years. In very wet years, the water table may be at a depth of 30 to 40 inches for a cumulative period of 1 to 3 weeks. The available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and is moderate in the subsoil.

3.4 Laboratory Soil Analysis

Selected soil samples recovered from the soil borings were analyzed for the percent soil fines passing the No. 200 sieve, natural moisture content, and corrosion series. Samples selected for laboratory testing were collected at depths ranging from 0 to 10 feet bls. These tests were performed to confirm visual soil classification and evaluate their engineering properties. The complete laboratory report is provided in Section 5.2.

The laboratory tests indicate the tested soils consist of sand with silt, silty sand, and very clayey sand. The tested sand with silt (SP-SM) contains approximately 6.4 to 10 percent soil fines passing the No. 200 sieve with natural moisture contents of about 4.8 to 7.1 percent. The tested silty sand (SM) contains approximately 14 to 19 percent soil fines passing the No. 200 sieve with natural moisture contents of about 6.3 to 8.5 percent. The tested very clayey sand (SC/CL) contains approximately 30 percent soil fines passing the No. 200 sieve with a natural moisture content of about 16 percent.

Two (2) soil samples were collected and analyzed for corrosion series testing. One soil sample was collected from SPT boring A-15 from 2 to 6 feet bls, while the other was collected from SPT boring A-16 from 2 to 6 feet bls. The soil sample from A-15 had a resistivity of 13,000 (ohm-cm) and the soil sample from A-16 had a resistivity of 15,000 (ohm-cm). The chloride contents of the tested samples were below detectable limits (BDL) for the soil samples from A-15 and A-16. The sulfate contents of the tested sampled were BDL for the soil samples from A-15 and A-16. The pH's of the tested samples were 8.35 and 8.26 for A-15 and A-16, respectively. The soils at the site are considered slightly aggressive for steel and concrete[3].

[3] Structures Design Guidelines, FDOT Structures Manual, Volume 1, January 2018, Table 1.3.2-1, p. 1-6.

4.0 EVALUATION AND RECOMMENDATIONS

4.1 General

The following recommendations are made based upon our understanding of the proposed construction, a review of the attached soil borings and laboratory test data, and experience with similar projects and subsurface conditions. If plans or the location of proposed construction changes from those discussed previously, GSE requests the opportunity to review and possibly amend our recommendations with respect to those changes.

The performance of site improvements may be sensitive to their post-construction relationship to site groundwater levels, seepage zones, or soil/rock characteristics exposed at final site grades. GSE recommends that use of boring information for final design of all site improvements be predicated on proper horizontal and vertical control of borings.

In this section of the report, we present our geotechnical parameters and recommendations to assist with the force main and water main designs as well as our general site preparation guidelines.

4.2 Groundwater

The groundwater table was encountered in SPT borings A-10, A-11, A-12, A-15, A-16, and A-18 at a depth of 8 feet bls at the time of our exploration. However, you should expect water to be at a depth of 1.5 to 3.5 feet bls after periods of heavy and seasonal rainfall.

4.3 Trench Excavation

Based on the information provided, we understand that the force main and water main will be constructed using trench and trenchless methods. The following subsections provide information for the design and construction of the force main and water main and excavations required for the proposed installation.

4.3.1 General

It is likely that auger pits will be required at certain locations to install the force main and water main. For design, the groundwater level should be assumed to exist at the seasonal high groundwater level since these conditions may exist after a heavy rain event. Geotechnical parameters were developed for the design of pit construction as part of the proposed force main and water main.

4.3.2 Geotechnical Parameters

Based on the soil conditions encountered by the borings, geotechnical design parameters were developed for the soils encountered across the site for the design of pit construction or horizontal directional drilling. These design parameters are provided in Table 1 below.

Table 1: Geotechnical Design Soil Parameters						
Boring No.	Range of Depths (ft bls)	Internal Friction Angle ϕ (degrees)	Moist Unit Weight γ (pcf)	Submerged Unit Weight γ (pcf)	Unconfined Compression q_u (ksf)	Cohesion c_u (ksf)
A-1	0 - 4	-	-	-	-	-
	4 - 10	29	95	33	-	-
A-2	0 - 10	30	103	41	-	-
A-3	0 - 10	30	98	36	-	-
A-4	0 - 6	30	98	36	-	-
	6 - 10	30	100	38	-	-
A-5	0 - 10	29	95	33	-	-
A-6	0 - 10	30	100	38	-	-
A-7	0 - 10	30	98	36	-	-
A-8	0 - 10	30	100	38	-	-
A-9	0 - 6	30	107	45	-	-
	6 - 10	-	118	62	4	2
A-10	0 - 10	30	108	46	-	-
A-11	0 - 6	30	103	41	-	-
	6 - 10	-	126	68	3	1.5
A-12	0 - 8	30	109	47	-	-
	8 - 10	-	126	69	4	2
A-13	0 - 8	30	100	38	-	-
	8 - 10	-	126	69	3	1.5
A-14	0 - 8	30	100	38	-	-
	8 - 10	-	126	69	3	1.5
A-15	0 - 8	29	96	34	-	-
	8 - 12	23	103	41	-	-
	12 - 20	-	126	68	4	2
A-16	0 - 8	30	107	45	-	-
	8 - 12	22	107	45	-	-
	12 - 20	-	126	69	4	2
A-17	0 - 8	30	105	43	-	-
	8 - 10	-	126	67	3	1.5
A-18	0 - 8	30	103	41	-	-
	8 - 10	23	115	53	-	-
A-19	0 - 8	30	103	41	-	-
	8 - 10	-	126	67	3	1.5

4.3.3 Excavation Stability

The open excavations may be shored or laid back to a stable slope or supported by some other equivalent means used to provide safety for workers and adjacent structures, if any. The excavations should be made in accordance with OSHA Standards, OSHA 2207, Subpart P, latest revision.

- Excavations less than 5 feet below land surface (bls) – Excavations that are less than 5 feet in depth should be effectively protected when an indication of ground movement is anticipated.
- Excavations greater than 5 feet bls – Excavations that are deeper than 5 feet should be sloped, shored, sheeted, braced, or laid back to a stable slope or supported by some other equivalent means or protection such that workers are not exposed to moving ground or cave-ins. The slopes and shoring should be in accordance with trench safety requirements as per OSHA Standards. For shoring greater than 20 feet (if needed), an engineering evaluation is required.

The excavation pits should be backfilled in accordance with the project specifications. It is likely the excavated material may be used as backfill material provided it meets the requirements of Section 4.7. Fill Suitability of this report. We recommend that the backfill be placed in maximum 12-inch loose lifts that are compacted to at least 95 percent of the Modified Proctor maximum dry density.

4.4 Trenchless Installation

We understand that portions of the proposed main lines will be installed using trenchless methods. Based on the soil conditions encountered, we recommend the geotechnical design parameters provided in Table 1 be used. GSE recommends that appropriate earth pressures be determined for the auger casing.

Carrier pipe must be sufficiently strong to withstand anticipated long-term ground loads and must not be subject to deterioration by substance either in the ground or in the casing. The carrier pipe design should include consideration of not only the loads applied to the pipe, but also factors other than soil loading. These factors could include minimum structural code requirements, loading from pipe jacking operations, and other construction loads. The geotechnical design parameters given in Table 1 should be used in analyzing the soil structure interaction of the carrier pipe.

4.5 Site Preparation

The soils at this site should be suitable for supporting the proposed construction using normal, good practice site preparation procedures. The following recommendations are our general guidelines for site preparation.

4.5.1 Stripping

If required, strip the construction limits and 10 feet beyond the perimeter of all grass, roots, topsoil, and other deleterious materials. You should expect to strip to depths of 12 or more inches. Deeper stripping may be necessary if major root systems are present at the site.

4.5.2 Dewatering

Temporary dewatering may be necessary for this project. If needed, we anticipate dewatering can be accomplished with sumps placed near the construction area, or with underdrains connected to a vacuum pump.

In any case, the site should always be graded to promote runoff and limit the amount of ponding. Localized ponding of stormwater is expected without proper grading during construction, and could render previously acceptable surfaces unacceptable.

4.5.3 Proof-Rolling

Although not anticipated, if required for slabs on grade or above ground improvements, proof-roll the subgrade with heavy rubber-tired equipment, such as a loaded front-end loader or dump truck, to identify any loose or soft zones not found by the soil borings. The proof-rolling should be monitored by a geotechnical engineer or qualified technician. Undercut or otherwise treat these zones as recommended by the geotechnical engineer in this report.

4.5.4 Fill Placement

Imported fill placed to raise the site grades or backfill for trenches should consist of clean sand having less than 10 percent passing the No. 200 sieve. On-site soils meeting the requirements of Section 4.7 may also be used as structural fill. The fill should be placed in maximum 12-inch loose lifts that are compacted to at least 95 percent of the Modified Proctor maximum dry density (ASTM D1557). If lighter “walk-behind” compaction equipment is used, this may require lifts of 4 inches or less to achieve the required degree of compaction.

4.6 Quality Control and Construction Materials Testing

It should be noted that the geotechnical engineering design does not end with the advertisement of the construction documents. As the geotechnical engineer of record, GSE is the most qualified to perform the construction materials testing that will be required for this project. The benefits of having the geotechnical engineer of record also perform the construction materials testing are numerous. If GSE continues to be involved with the project through construction, we will be able to constantly re-evaluate and possibly alter our geotechnical recommendations in a timely and cost-effective manner once final design and construction techniques are developed. This often results in cost savings for the project.

4.7 Fill Suitability

The soils encountered at this site within the explored depths range from sands (SP) to clays (CL/CH). A discussion of the suitability for reuse as structural fill for each soil classification according to the Unified Soil Classification System (USCS) designation is provided below.

SP, SP-SM – Sands (SP) and sand with silt (SP-SM) have less than 5 percent and 12 percent soil fines passing the No. 200 sieve, respectively, and are typically well draining soils that are suitable for reuse as structural fill. The sands with silt may require moisture conditioning (drying) to make the material more workable. These soils will require stockpiling and drying before they are reused if they are excavated from below the water table.

SM – Silty sands (SM) can have between 12 percent and 50 percent soil fines passing the No. 200 sieve. Silty sands are typically non-plastic or have low plasticity, and can be reused as structural fill with precautions. Silty sands can be moisture sensitive and difficult to work and compact and can rut if the moisture content is near or above the optimum moisture content. We recommend these soils be moisture conditioned (dried) so that the moisture content during use is at or below the optimum moisture content. Aerating and exposure to the sun is typically the most effective methods of drying these soils. It may not be practical to reuse these materials during the wet season, as frequent rain showers may not allow these soils to dry to a workable moisture content. Suitable silty sands are limited to soil having less than 30 percent soil fines passing the No. 200 sieve. Silty sands with more than 30 percent soil fines are especially moisture sensitive, and are not recommended for reuse as structural fill. These soils will behave more as sandy silt, and for this reason, very silty sands having more than 30 percent soil fines passing the No. 200 sieve have been assigned a dual classification of SM/ML. Silty sand soils that are excavated from below the water table are not recommended for reuse as structural fill due to the amount of time that will be required to dry these soils to a workable condition.

SC – Clayey sand (SC) soils can have between 12 percent and 50 percent soil fines passing the No. 200 sieve. Clayey sands can have a high range of plasticity, varying from a PI of 7 or greater and plotting above the A-line to highly plastic. Friable clayey sands are typically suitable for use as structural fill with precautions. Clayey sands will be moisture sensitive and difficult to work and compact and can rut during placement if the moisture content is near or above the natural moisture content. We recommend these soils be moisture conditioned (dried) so that the moisture content during use is at or below the optimum moisture content. Aerating and exposure to the sun is typically the most effective methods of drying these soils. It may not be practical to reuse these materials during the wet season, as frequent rain showers may not allow these soils to dry to a workable moisture content. Suitable clayey sands are limited to soil having less than 30 percent soil fines passing the No. 200 sieve. Clayey sands with more than 30 percent soil fines passing the No. 200 sieve are especially moisture sensitive and are typically highly plastic, and are not recommended for reuse as structural fill. These soils will behave more as sandy clay, and for this reason, very clayey sands having more than 30 percent soil fines passing the No. 200 sieve have been assigned a dual classification of SC/CH or SC/CL. Clayey sand soils that are excavated from below the water table are not recommended for reuse as structural fill due to the amount of time that will be required to dry these soils to a workable condition.

ML, MH, CL, CH – Silts and clays are not suitable materials for reuse as structural fill.

When using on-site soils as fill materials, we recommend the silty and clayey sand soils (SM, SC) be used in the lower depths of the fill. Sand and sand with silt (SP, SP-SM) should be used in the upper portions of the fill. We recommend a minimum of 2 feet of sand (SP, SP-SM) cover the silty and clayey sand fill materials to reduce the potential for soggy surface conditions due to the low permeability characteristics of the silty and clayey sand materials.

5.0 FIELD DATA

5.1 Standard Penetration Test Soil Boring Logs

GSE Engineering & Consulting, Inc.
5590 SW 64th Street, Suite B
Gainesville, Florida 32608
Telephone: (352) 377-3233
Fax: (352) 377-0335

BORING NUMBER A-1

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SM) Brown silty SAND		AU 1					14	6.3	
			4	AU 2							
5		(SP) Loose brown SAND		SPT 3	2-3-2-2 (5)						
			8	SPT 4	3-3-4-3 (7)						
10		(SP-SM) Very loose brown SAND with silt	10	SPT 5	3-2-2-4 (4)						
		Bottom of borehole at 10.0 feet.									

SPT BORINGS - GINT STD US.GDT - 9/6/23 15:32 - C:\USERS\JGALLER\DESKTOP\16198 BORINGS.GPJ

GSE Engineering & Consulting, Inc.
5590 SW 64th Street, Suite B
Gainesville, Florida 32608
Telephone: (352) 377-3233
Fax: (352) 377-0335

BORING NUMBER A-2

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** NE
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Dark brown SAND with silt ▽	2	AU 1							20 40 60 80
		(SP-SM) Loose brown SAND with silt		AU 2							
5			6	SPT 3	2-3-4-4 (7)						
		(SP) Loose pale brown SAND		SPT 4	3-4-4-3 (8)						
10			10	SPT 5	2-3-3-4 (6)						
		Bottom of borehole at 10.0 feet.									

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GSE Engineering & Consulting, Inc.
5590 SW 64th Street, Suite B
Gainesville, Florida 32608
Telephone: (352) 377-3233
Fax: (352) 377-0335

BORING NUMBER A-3

CLIENT Jones Edmunds & Associates, Inc. **PROJECT NAME** South 301 W Water and Wastewater Pipelines

PROJECT NUMBER 16198 **PROJECT LOCATION** Zephyrhills, Pasco County, Florida

DATE STARTED _____ **COMPLETED** _____ **GROUND ELEVATION** _____ **HOLE SIZE** _____

DRILLING CONTRACTOR Watson's Drilling, LLC **GROUND WATER LEVELS:**

DRILLING METHOD Flight Auger ▼ **AT TIME OF DRILLING** NE

LOGGED BY LBW **CHECKED BY** KPF ▽ **ESTIMATED SEASONAL HIGH** 1.5 ft

NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Very loose dark brown SAND with silt ▽		AU 1							20 40 60 80
				AU 2							
5				SPT 3	3-2-2-3 (4)						
		(SP) Loose pale brown SAND	6	SPT 4	3-4-3-3 (7)						
10			10	SPT 5	4-4-3-4 (7)						
		Bottom of borehole at 10.0 feet.									

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GSE Engineering & Consulting, Inc.
5590 SW 64th Street, Suite B
Gainesville, Florida 32608
Telephone: (352) 377-3233
Fax: (352) 377-0335

BORING NUMBER A-4

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SM) Loose dark brown silty SAND		AU 1							
				AU 2					19	8.5	
5			6	SPT 3	2-3-3-4 (6)						
		(SP) Loose pale brown SAND		SPT 4	3-4-4-3 (8)						
10			10	SPT 5	3-2-3-4 (5)						
		Bottom of borehole at 10.0 feet.									

SPT 20 40 60 80

SPT BORINGS - GINT STD US.GDT - 9/6/23 15:32 - C:\USERS\JGALLER\DESKTOP\16198 BORINGS.GPJ

GSE Engineering & Consulting, Inc.
5590 SW 64th Street, Suite B
Gainesville, Florida 32608
Telephone: (352) 377-3233
Fax: (352) 377-0335

BORING NUMBER A-5

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Gray SAND with silt		AU 1							20 40 60 80
				AU 2							
			4								
5		(SP) Very loose to loose brown SAND		SPT 3	3-2-3-3 (5)						
				SPT 4	3-2-2-4 (4)						
10				SPT 5	3-4-3-3 (7)						
			10								
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-6

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0		(SP-SM) Loose brown SAND with silt		AU 1							
				AU 2							
5				SPT 3	3-3-2-2 (5)						
			6								
		(SP) Loose pale brown SAND		SPT 4	3-4-4-3 (8)						
10				SPT 5	3-3-3-4 (6)						
			10								
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-7

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲ (20 40 60 80)
0		(SP-SM) Brown SAND with silt	2	AU 1							
		(SP) Loose tan SAND		AU 2							
5				SPT 3	2-2-3-2 (5)						▲
				SPT 4	2-2-3-2 (5)						▲
10			10	SPT 5	3-4-4-3 (8)						▲
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-8

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt		AU 1							20 40 60 80
				AU 2							
			4								
5		(SP) Very loose to loose pale brown SAND		SPT 3	3-2-2-4 (4)						
				SPT 4	3-4-4-3 (8)						
10				SPT 5	3-4-3-3 (7)						
			10								
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-9

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING NE
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Dark brown SAND with silt		AU 1							
				AU 2							
			4								
5		(SP) Loose pale brown SAND		SPT 3	3-4-4-3 (8)						
			6								
		(CL/CH) Firm to stiff orange and gray CLAY		SPT 4	4-3-4-5 (7)						
10				SPT 5	4-6-6-7 (12)						
			10								
		Bottom of borehole at 10.0 feet.									

SPT 20 40 60 80

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BORING NUMBER A-10

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** 8.0 ft
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt	2	AU 1							20 40 60 80
		(SP) Loose to medium dense pale brown SAND		AU 2							
5				SPT 3	3-4-3-3 (7)						
				SPT 4	2-3-3-4 (6)						
10			10	SPT 5	3-4-8-3 (12)						
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-11

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING 8.0 ft
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 1.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt		AU 1							20 40 60 80
			4	AU 2							
5		(SP) Loose pale brown SAND	6	SPT 3	3-4-3-3 (7)						
		(CL/CH) Stiff orange and gray sandy CLAY		SPT 4	4-5-8-4 (13)						
10			10	SPT 5	5-4-6-6 (10)						
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-12

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
AT TIME OF DRILLING 8.0 ft
LOGGED BY LBW **CHECKED BY** KPF
ESTIMATED SEASONAL HIGH 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt	2	AU 1							
		(SP-SM) Loose pale brown SAND with silt		AU 2							
5				SPT 3	3-4-4-3 (8)				6.4	5.0	
			8	SPT 4	5-4-5-5 (9)						
10		(CL/CH) Stiff gray and orange CLAY	10	SPT 5	4-5-7-7 (12)						
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-13

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** NE
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP) Brownish orange SAND	2	AU 1							20 40 60 80
		(SP-SM) Gray SAND with silt ▽	4	AU 2							
5		(SP) Loose pale brown SAND		SPT 3	3-3-2-3 (5)						
			8	SPT 4	3-4-4-3 (8)						
10		(CL/CH) Stiff brown sandy CLAY	10	SPT 5	5-6-6-7 (12)						
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-14

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** NE
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Gray SAND with silt	2	AU 1							
		(SP) Loose pale brown SAND		AU 2							
5				SPT 3	2-3-2-4 (5)						
			8	SPT 4	3-4-4-3 (8)						
		(CL/CH) Stiff brown sandy CLAY		SPT 5	5-5-7-7 (12)						
10			10								
		Bottom of borehole at 10.0 feet.									

20 40 60 80

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BORING NUMBER A-15

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** 8.0 ft
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Loose brown SAND with silt		AU 1							
				AU 2							
		pH = 8.35 *R = 13000* ▽ *Cl = BDL* *S = BDL*									
5				SPT 3	2-2-3-2 (5)				7.8	4.8	
			6								
		(SP) Loose pale brown SAND		SPT 4	2-3-3-4 (6)						
		▼	8								
		(SC) Loose orange clayey SAND		SPT 5	3-3-4-6 (7)						
10											
			12								
		(CL/CH) Stiff orange and gray sandy CLAY									
				SPT 6	4-5-6 (11)						
15											
			17								
		(CL/CH) Stiff gray CLAY with limestone									
				SPT 7	5-6-6 (12)						
20			20								
		Bottom of borehole at 20.0 feet.									

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BORING NUMBER A-16

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** 8.0 ft
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt	2	AU 1							
		(SP-SM) Loose pale brown SAND with silt *pH = 8.26* *R = 15000* ▽ *Cl = BDL* *S = BDL*		AU 2							
5				SPT 3	3-3-4-3 (7)				10	7.1	
		▼	8	SPT 4	3-2-7-3 (9)						
		(SC/CL) Loose orange very clayey SAND		SPT 5	3-4-4-5 (8)						
10			12								
		(CL/CH) Stiff gray and orange sandy CLAY		SPT 6	4-5-5 (10)						
15			17								
		(CL/CH) Stiff gray CLAY with limestone		SPT 7	6-7-7 (14)						
20			20								
		Bottom of borehole at 20.0 feet.									

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BORING NUMBER A-17

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** NE
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt	2	AU 1							20 40 60 80
		(SP) Loose pale brown SAND		AU 2							
5				SPT 3	3-3-4-3 (7)						
			8	SPT 4	3-4-4-3 (8)						
		(CL/CH) Stiff brown sandy CLAY		SPT 5	4-6-5-5 (11)						
10			10								
		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-18

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** 8.0 ft
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt	2	AU 1							20 40 60 80
		(SP) Loose pale brown SAND		AU 2							
5				SPT 3	3-4-3-3 (7)						
			8	SPT 4	4-4-3-4 (7)						
		(SC/CL) Loose brown very clayey SAND	10	SPT 5	4-5-5-6 (10)				30	16	
10		Bottom of borehole at 10.0 feet.									

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BORING NUMBER A-19

CLIENT Jones Edmunds & Associates, Inc.
PROJECT NAME South 301 W Water and Wastewater Pipelines
PROJECT NUMBER 16198
PROJECT LOCATION Zephyrhills, Pasco County, Florida
DATE STARTED _____ **COMPLETED** _____
GROUND ELEVATION _____ **HOLE SIZE** _____
DRILLING CONTRACTOR Watson's Drilling, LLC
GROUND WATER LEVELS:
DRILLING METHOD Flight Auger
▼ **AT TIME OF DRILLING** NE
LOGGED BY LBW **CHECKED BY** KPF
▽ **ESTIMATED SEASONAL HIGH** 3.5 ft
NOTES _____

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	CONTACT DEPTH (ft)	SAMPLE TYPE NUMBER	BLOW COUNTS (N VALUE)	LIQUID LIMIT, %	PLASTIC LIMIT, %	PLASTICITY INDEX	PERCENT PASS NO. 200 SIEVE	MOISTURE CONTENT, %	▲ SPT N VALUE ▲
0		(SP-SM) Brown SAND with silt	2	AU 1							20 40 60 80
		(SP) Loose pale brown SAND		AU 2							
5				SPT 3	3-4-3-3 (7)						
			8	SPT 4	3-3-4-4 (7)						
10		(CL/CH) Stiff brown sandy CLAY	10	SPT 5	4-6-5-5 (11)						
		Bottom of borehole at 10.0 feet.									

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5.2 Laboratory Results

GSE Engineering & Consulting, Inc.

SUMMARY REPORT OF LABORATORY TEST RESULTS

Project Number: 16198

Project Name: South 301 W Water and Wastewater Pipelines

Boring Number	Depth (ft)	Soil Description	Natural Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	Percent Passing No. 200 Sieve	Organic Content (%)	Hydraulic Conductivity (ft/day)	Unified Soil Classification
A-1	0-2	Brown silty SAND	6.3				14			SM
A-4	2-4	Loose dark brown silty SAND	8.5				19			SM
A-12	4-6	Loose pale brown SAND with silt	5.0				6.4			SP-SM
A-15	2-6	Loose brown SAND with silt	4.8				7.8			SP-SM
A-16	2-6	Loose pale brown SAND with silt	7.1				10			SP-SM
A-18	8-10	Loose brown very clayey SAND	16				30			SC/CL

GSE Engineering & Consulting, Inc.

SUMMARY REPORT OF LABORATORY TEST RESULTS

Project Number: 16198

Project Name: South 301 W Water and Wastewater Pipelines

Boring Number	Depth (ft)	Soil Description	pH	Resistivity (ohm-cm)	Chloride Content (ppm)	Sulfate Content (ppm)
A-15	2-6	Loose brown SAND with silt	8.35	13000	BDL	BDL
A-16	2-6	Loose pale brown SAND with silt	8.26	15000	BDL	BDL

5.3 Key to Soil Classification

KEY TO SOIL CLASSIFICATION CHART

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests				SYMBOLS		GROUP NAME
				GRAPHIC	LETTER	
COARSE-GRAINED SOILS	Gravels	Clean Gravels	Cu ≥ 4 and 1 ≤ Cc ≤ 3		GW	Well graded GRAVEL
More than 50% retained on No. 200 sieve	More than 50% of coarse fraction retained on No. 4 sieve	Less than 5% fines	Cu < 4 and/or 1 > Cc > 3		GP	Poorly graded GRAVEL
		Gravels with fines	Fines classify as ML or MH		GM	Silty GRAVEL
		More than 12% fines	Fines classify as CL or CH		GC	Clayey GRAVEL
	Sands	Clean Sands	Cu ≥ 6 and 1 ≤ Cc ≤ 3		SW	Well graded SAND
	50% or more of coarse fraction passes No. 4 sieve	Less than 5% fines	Cu < 6 and/or 1 > Cc > 3		SP	Poorly graded SAND
		Sand with fines	Fines classify as ML or MH		SP-SM	SAND with silt
		5% ≤ fines < 12%	Fines classify as CL or CH		SP-SC	SAND with clay
		Sand with fines	Fines classify as ML or MH		SM	Silty SAND
		12% ≤ fines < 30%	Fines classify as CL or CH		SC	Clayey SAND
		Sand with fines	Fines classify as ML or MH		SM	Very silty SAND
		30% fines or more	Fines classify as CL or CH		SC	Very clayey SAND
FINE-GRAINED SOILS	Clays	inorganic	50% ≤ fines < 70%		CL/CH	Sandy CLAY
50% or more passes the No. 200 sieve			70% ≤ fines < 85%		CL/CH	CLAY with sand
			fines ≥ 85%		CL/CH	CLAY
	Silts and Clays	inorganic	PI > 7 and plots on/above "A" line		CL	Lean CLAY
	Liquid Limit less than 50		PI < 4 or plots below "A" line		ML	SILT
		organic	Liquid Limit - oven dried / Liquid Limit - not dried < 0.75		OL	Organic clay / Organic silt
	Silts and Clays	inorganic	PI plots on or above "A" line		CH	Fat CLAY
	Liquid Limit 50 or more		PI plots below "A" line		MH	Elastic SILT
		organic	Liquid Limit - oven dried / Liquid Limit - not dried < 0.75		OH	Organic clay / Organic silt
HIGHLY ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor				PT	PEAT

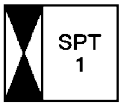
CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

	No. OF BLOWS, N	RELATIVE DENSITY
	0 - 4	Very Loose
	5 - 10	Loose
SANDS:	11 - 30	Medium dense
	31 - 50	Dense
	OVER 50	Very Dense

	No. OF BLOWS, N	RELATIVE DENSITY
	0 - 8	Very Soft
	9 - 18	Soft
LIMESTONE:	19 - 32	Moderately Hard
	33 - 50	Hard
	OVER 50	Very Hard

	No. OF BLOWS, N	CONSISTENCY
	0 - 2	Very Soft
SILTS	3 - 4	Soft
&	5 - 8	Firm
CLAYS:	9 - 15	Stiff
	16 - 30	Very Stiff
	31 - 50	Hard
	OVER 50	Very Hard

SAMPLE GRAPHIC TYPE LEGEND



Location of SPT Sample



Location of Auger Sample

PARTICLE SIZE IDENTIFICATION

BOULDERS:		Greater than 300 mm
COBBLES:		75 mm to 300 mm
GRAVEL:	Coarse -	19.0 mm to 75 mm
	Fine -	4.75 mm to 19.0 mm
SANDS:	Coarse -	2.00 mm to 4.75 mm
	Medium -	0.425 mm to 2.00 mm
	Fine -	0.075 mm to 0.425 mm
SILTS & CLAYS:		Less than 0.075 mm

LABORATORY TEST LEGEND

LL	=	Liquid Limit, %
PL	=	Plastic Limit, %
PI	=	Plasticity Index, %
% PASS - 200	=	Percent Passing the No. 200 Sieve
MC	=	Moisture Content, %
ORG	=	Organic Content, %
k_h	=	Horizontal Hydraulic Conductivity, ft/day

6.0 LIMITATIONS

6.1 Warranty

This report has been prepared for our client for their exclusive use, in accordance with generally accepted soil and foundation engineering practices, and makes no other warranty either expressed or implied as to the professional advice provided in the report.

6.2 SPT Borings

The determination of soil type and conditions was performed from the ground surface to the maximum depth of the borings, only. Any changes in subsurface conditions that occur between or below the borings would not have been detected or reflected in this report.

Soil classifications that were made in the field are based upon identifiable textural changes, color changes, changes in composition or changes in resistance to penetration in the intervals from which the samples were collected. Abrupt changes in soil type, as reflected in boring logs and/or cross sections may not actually occur, but instead, be transitional.

Depth to the water table is based upon observations made during the performance of the SPT borings. This depth is an estimate and does not reflect the annual variations that would be expected in this area due to fluctuations in rainfall and rates of evapotranspiration.

6.3 Site Figures

The measurements used for the preparation of the figures in this report were made using the provided site plans and by estimating distances from existing structures and site features. Figures in this report were not prepared by a licensed land surveyor and should not be interpreted as such.

6.4 Unanticipated Soil Conditions

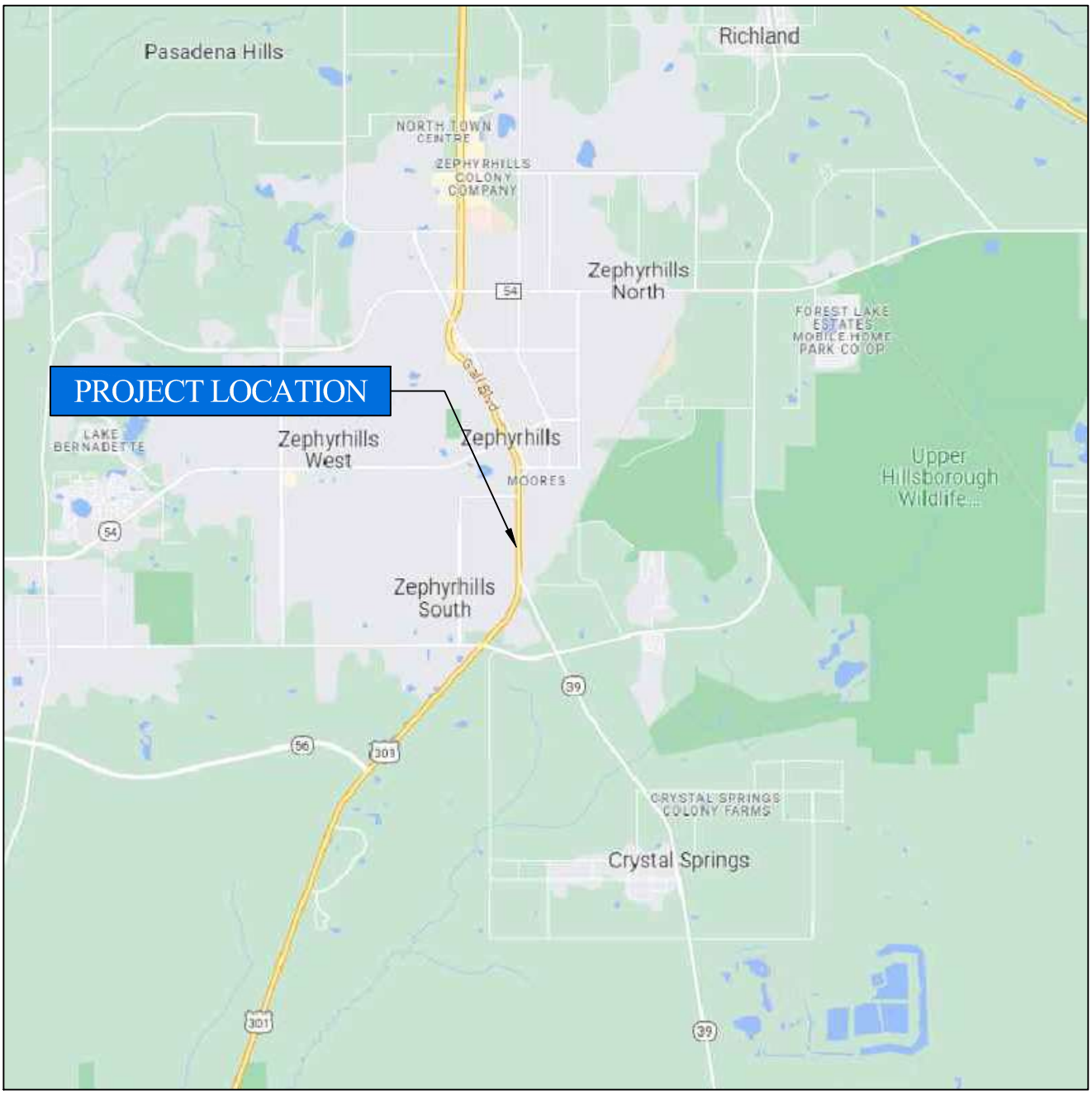
The analysis and recommendations submitted in this report are based upon the data obtained from soil borings performed at the locations indicated on Figures 2A and 2B. This report does not reflect any variations that may occur between these borings.

The nature and extent of variations between borings may not become known until excavation begins. If variations appear, we may have to re-evaluate our recommendations after performing on-site observations and noting the characteristics of any variations.

6.5 Misinterpretation of Soil Engineering Report

GSE Engineering & Consulting, Inc. is responsible for the conclusions and opinions contained within this report based upon the data relating only to the specific project and location discussed herein. If others make the conclusions or recommendations based upon the data presented, those conclusions or recommendations are not the responsibility of GSE.

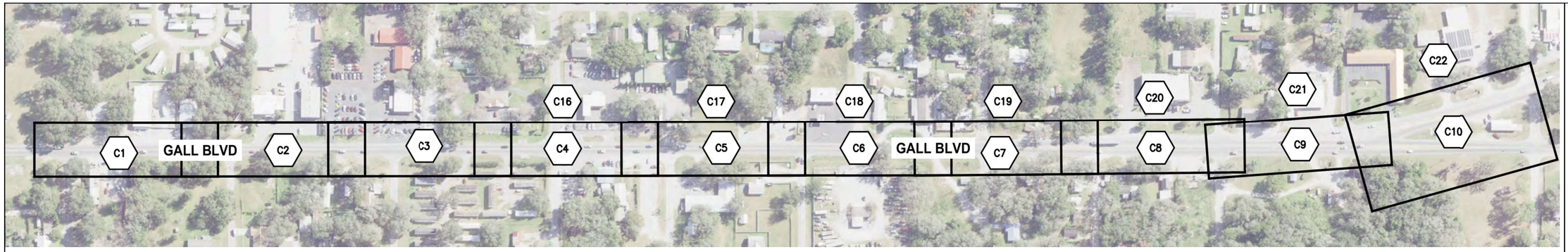
FIGURES

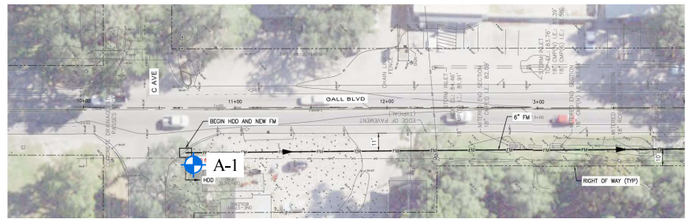


NORTH

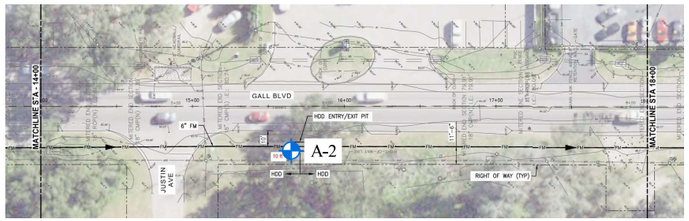
NOT TO SCALE

SOUTH 301 W WATER AND WASTEWATER PIPELINES ZEPHYRHILLS, PASCO COUNTY, FLORIDA GSE PROJECT NO. 16198	PROJECT SITE LOCATION MAP		
	DESIGNED BY: KPF CHECKED BY : JEG DRAWN BY : EEW	GSE Engineering & Consulting, Inc.	FIGURE 1

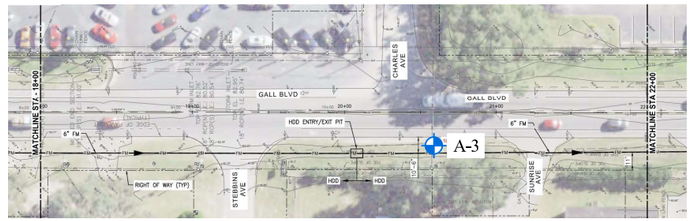




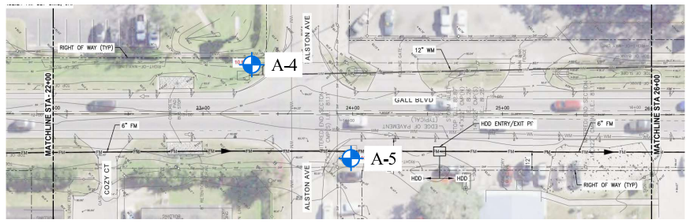
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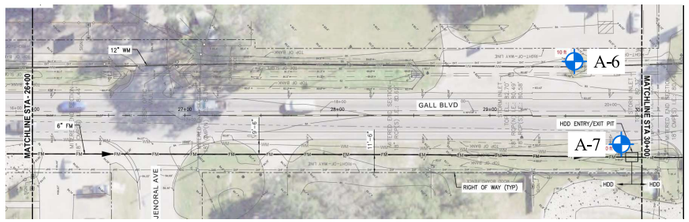
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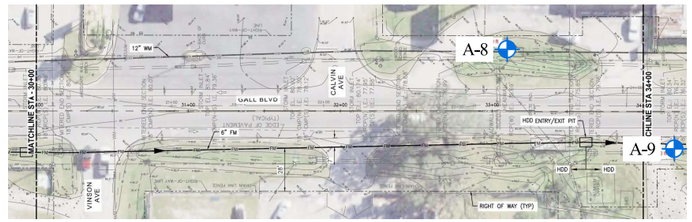
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C4



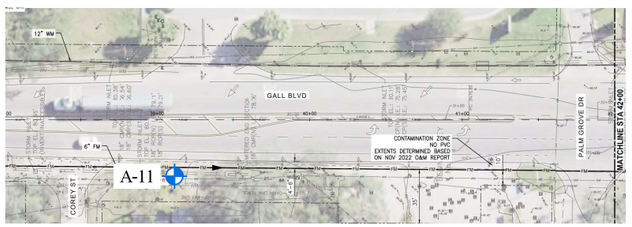
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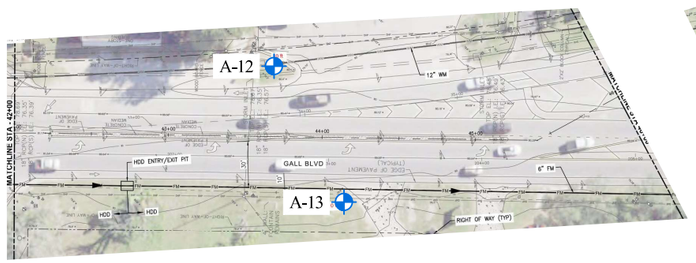
C6



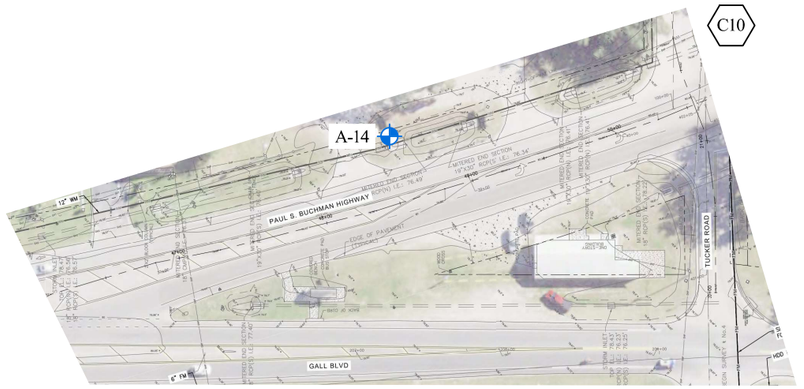
C7



C8



C9



C10

LEGEND:

SPT BORING

NORTH

0 100'

SCALE: 1" = 100' APPROX.

PARTIAL SITE PLAN SHOWING APPROXIMATE LOCATIONS OF FIELD TESTS

DESIGNED BY : KPF
CHECKED BY : JEG
DRAWN BY : EEW

FIGURE 2A

GSE Engineering & Consulting, Inc.

SOUTH 301 W WATER AND WASTEWATER PIPELINES
ZEPHYRHILLS, PASCO COUNTY, FLORIDA
GSE PROJECT NO. 16198

C11

C12

C13

C14

C15

LEGEND:

SPT BORING

NORTH

0 100'

SCALE: 1" = 100' APPROX.

PARTIAL SITE PLAN SHOWING APPROXIMATE LOCATIONS OF FIELD TESTS

FIGURE 2B

GSE Engineering & Consulting, Inc.

DESIGNED BY : KPF
CHECKED BY : JEG
DRAWN BY : EEW

SOUTH 301 W WATER AND WASTEWATER PIPELINES
ZEPHYRHILLS, PASCO COUNTY, FLORIDA
GSE PROJECT NO. 16198

APPENDIX B

PERMITS

Pasco County
Florida Department of Transportation (FDOT)
Florida Department of Environmental Protection (FDEP) (Water)
Florida Department of Environmental Protection (FDEP) (Wastewater)

Pasco County Permit

FDOT Permit

FLORIDA DEPARTMENT OF TRANSPORTATION

UTILITY PERMIT

December 14, 2016

PERMIT NO: 2023-H-798-00197

STATE ROAD INFORMATION

County:	Section:	State Road No:	Beginning Mile Post:	Ending Mile Post:
Pasco	14050000	SR 41	3.588	3.588

APPLICANT INFORMATION

The Utility Agency Owner (UAO) shall be identified in this Applicant Information Box. When the UAO is a City or County and desires to have the Utility Builder make a joint permit applicant, as prescribed in Section 2.1(4) of the 2017 Utility Accommodation Manual (UAM), the Utility Builder shall also be identified in this Applicant Information Box. A Utility Builder alone cannot apply for a utility permit without the City or County adding them as a joint applicant.

Utility Agency/Owner (UAO)

Name: City of Zephyrhills Utilities Department
Contact Person: City of Zephyrhills Utilities Department
Address: 5335 8th St
City: Zephyrhills
State: Florida
Zip: 33542
Telephone: 8137800008
Email: jbostic@ci.zephyrhills.fl.us

Utility Builder (only applicable when the UAO is a City or County)

Name:
Contact Person:
Address:
City:
State:
Zip:
Telephone:
Email:

WORK DESCRIPTION

The Applicant(s) requests permission from the Florida Department of Transportation (FDOT) to construct, operate, and maintain the utilities as described below and as depicted in the incorporated documentation.

The project includes the installation of approximately 6,000 LF of 6" PVC sanitary sewer force main and 3,000 LF of 12" PVC potable water main. Project restoration will include; pavement repair, mill and overlay of the roads, re-sodding of affected areas, and replacement of concrete curb/gutter and sidewalk.

Utility Work No:

Additional sheets are attached and are incorporated into this permit Yes ☐ No ☑

For FDEP certification, the FDOT agency report is attached in accordance with UAM Section 2.4.1 (13) Yes ☐ No ☑

TRAFFIC CONTROL (TCP)

☑ The TCP will comply with the following 600 series index(es) 602, 611

☐ A TCP has been attached and incorporated into this permit application in compliance with UAM Section 2.4.2.

MOT Technician's contact information (may be supplied at the two (2) business day notification to FDOT):

Name: _____ Telephone _____ Email: _____

COMMENCEMENT OF WORK

The UAO and/or Utility Builder shall commence actual construction in good faith within sixty (60) calendar days after approval of the permit application. If the beginning date is more than sixty (60) calendar days from the date of approval, the UAO and/or Utility Builder must review the permit with the FDOT Approving Engineer listed to make sure no changes have occurred to the transportation facility that would affect the permit's continued approval. The UAO and/or Utility Builder shall make good faith efforts to expedite the work and complete the work within the calendar days indicated.

Anticipated Start Date: 1/1/2024

Calendar days needed to completed: 365

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

Florida Department of Transportation

UTILITY PERMIT

PERMIT NO: 2023-H-798-00197

APPLICANT SIGNATURE

By the below signature(s) the UAO and/or Utility Builder agree(s) to construct, operate, and maintain the work as noted in the above Work Description, shown in plans and incorporated documents, in compliance with the UAM, all instructions noted in the FDOT Special Instructions Box, and special instructions incorporated into this permit. The UAO and/or Utility Builder declares, the location of all existing utilities that it owns or has an interest in, both aerial and underground, are accurately shown on the plans of the work areas. In accordance with UAM Section 2.8, the UAO and/or Utility Builder further declares that a letter of notification was delivered to the owners of other facilities within the work areas and that those listed below are the only facility owners known to be involved or potentially impacted by the proposed work.

Date Notified:	Name of other facility owners (attach additional sheets if necessary).
6/22/2023	Charter Communications
6/22/2023	City of Zephyrhills
7/3/2023	Duke Energy
6/22/2023	Frontier Communications
6/22/2023	Pasco County Utilities

Utility Agency/Owner	Utility Builder (when applicable)
Signature: JOHN BOSTIC III (digital signature) Date: 9/25/2023	Signature: _____ Date: _____
Name (printed): JOHN BOSTIC III	Name (printed): _____
Title: _____	Title: _____

FDOT PROJECT INFORMATION

Pursuant to UAM Section 2.1(10), the utility work is within FDOT projects listed below and must have a Utility Work Schedule for each project approved prior to commencement of work within the FDOT project limits:

FDOT construction is proposed or underway. Refer to Financial Project Id: FDOT project # 440063-1
Please find attached the Utility Permit on the above referenced project from the City of Zephyrhills.
The scope of work under this permit is for adjustment of existing facilities along the US 301/SR

FDOT SPECIAL INSTRUCTIONS

In accordance with UAM Section 2.7, FDOT incorporates the below and attached special instructions into this permit.

Contact FDOT James Meyer 48 hours before working in FDOT R/W 352-848-2610, to activate permit.

Provide MOT Technician “Name, Phone Number, Email Address”.

Ensure time line provided is followed for the Tucker Road and US 301 work near the south end of this project, So no conflict with FDOT project occurs.

Additional FDOT Special Instructions are attached and incorporated into this permit. Yes ☑ No ☐

PERMIT APPROVAL

By signature below, FDOT gives permission to the UAO and /or Utility Builder to construct, operate, and maintain the utilities indicated in this Utility Permit in compliance with the UAM, all incorporated documents, and special instructions. Any changes to the approved work must be approved by the FDOT’s Approving Engineer and attached and incorporated into this permit in accordance with UAM Section 2.11.

Approving Engineer: James A. Meyer (digital signature) Date: 11/6/2023
Name: James A. Meyer
Title: MAINTENANCE MANAGER/PERMITS

Notification of Utility Work to be provided to: Telephone (352) 848-2600 ext. 2610 or Email: james.meyer@dot.state.fl.us

An FDOT Representative is required to be present on the worksite prior to commencement of work. Yes ☑ No ☐

Rep. Name: David Skrelunas Telephone 3528482606 Email: david.skrelunas@dot.state.fl.us

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

Florida Department of Transportation

UTILITY PERMIT

PERMIT NO: 2023-H-798-00197

CERTIFICATION

I, the undersigned UAO and/or Utility Builder, hereby CERTIFY that the utilities were constructed and inspected in compliance with the UAM all incorporated documents, and special instructions. Pursuant to UAM Section 2.11, all changes have been approved by the FDOT's Approving Engineer and incorporated into this permit along with all other material certifications, test results, bore logs, approved plans changes, as-built plans or other required documentation.

I also CERTIFY that work began on _____ and was completed on _____ and that the area was left in as good or better condition than when the work began.

Utility Agency/Owner	Utility Builder (when applicable)
Signature: _____ Date _____	Signature:_____ Date _____
Name (printed): _____	Name (printed): _____
Title: _____	Title: _____

FINAL INSPECTION OF WORK

☐ The work was inspected and found to be in non-compliance as noted below:

☐ All issues of non-compliance listed above have been brought into compliance and/or FDOT has no outstanding issues that need to be addressed by the UAO and/or Utility Builder. However, this final inspection does not release the UAO and/or Utility Builder of their continuing responsibilities pursuant to Rule 14-46.001, the UAM, all incorporated documents, and special instructions.

FDOT Inspector: _____ Date: _____

Name: _____

Title: _____

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

PERMIT NO.: 2023-H-798-00197

STATE ROAD INFORMATION:
Pasco SR 41, Section: 14050000, Begin MP: 3.588, End MP: 3.588, Pasco SR 39, Section: 14110000, Begin MP: 3.448, End MP: 3.448

NAME OF OTHER FACILITY OWNERS / DATE NOTIFIED:
Facility Name: Teco, Date Notified: 6/22/2023, Facility Name: Southfork M/ H Community, Date Notified: 6/22/2023, Facility Name: Uniti FIber, Date Notified: 6/23/2023, Facility Name: Blue Triton Brands, Date Notified: 6/26/2023

FDOT PROJECT INFORMATION:
FDOT construction is proposed or underway. Refer to Financial Project Id: FDOT project # 440063-1
Please find attached the Utility Permit on the above referenced project from the City of Zephyrhills. The scope of work under this permit is for adjustment of existing facilities along the US 301/SR 41 corridor to accommodate the proposed FDOT improvements. The installation has been reviewed with the Construction Resident Office and special requirements are listed below.
• City of Zephyrhills representatives will need to contact Joe Goddard (727-543-3614) 7 days prior to beginning utility installations.
The Zephyrhills pipeline project is on a 15-month construction schedule as follows:

• First week of January 2024: begin shop drawing review and material procurement. (3 months)
• March 2024: begin construction at the northernmost end of the construction corridor. (12 months)

With the Tucker-road crossing at the southernmost end of the project, it is anticipated this section of the project would not be impacted until the fall of 2024.

THE WORK WAS INSPECTED AND FOUND TO BE IN NON-COMPLIANCE AS NOTED BELOW:

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

continuation page

PERMIT NO.: 2023-H-798-00197

The complete special instructions could not fit in the space allotted on Page 2 of the Utility Permit so they are displayed below.

Special FDOT Instructions

Contact FDOT James Meyer 48 hours before working in FDOT R/W 352-848-2610, to activate permit.

Provide MOT Technician “Name, Phone Number, Email Address”.

Ensure time line provided is followed for the Tucker Road and US 301 work near the south end of this project, So no conflict with FDOT project occurs.

Sidewalks shall NOT be closed more than 2 weeks the duration of the permit. The contractor will need to provide accommodation for pedestrians.
Any damaged sidewalk shall be repaired per SP# 522-001 & 522-002.

Any damage to FDOT Rdwy. shall be repaired 50' in each direction entire width of the land. Match existing

Restore FDOT R/W with sod only.

Contact Scott Brown Pasco County for locates of lighting fiber and signal conduits Pasco County
727-849-6845

Enter in the FDOT’s One Stop Permitting – “Certify Construction Complete” or provide, original signed copy of Permit Application (pg. 3 of 3) and As-builts. Once construction is completed for permit close out.

FDOT project # 440063-1
Please find attached the Utility Permit on the above referenced project from the City of Zephyrhills. The scope of work under this permit is for adjustment of existing facilities along the US 301/SR 41 corridor to accommodate the proposed FDOT improvements. The installation has been reviewed with the Construction Resident Office and special requirements are listed below.
• City of Zephyrhills representatives will need to contact Joe Goddard (727-543-3614) 7 days prior to beginning utility installations.
The Zephyrhills pipeline project is on a 15-month construction schedule as follows:
• First week of January 2024: begin shop drawing review and material procurement. (3 months)
• March 2024: begin construction at the northernmost end of the construction corridor. (12 months)
With the Tucker-road crossing at the southernmost end of the project, it is anticipated this section of the project would not be impacted until the fall of 2024.
• Please ensure the City of Zephyrhills is clear of drainage structures & drainage pipe throughout the project limits. Along with understanding the size of the structures that will be installed and needing proper shoring and stabilizing methods with the surrounding areas around the structure, and clear of Light Pole and Mast Arms Foundations throughout the project.
• Be aware that the facilities that the City of Zephyrhills is installing are for the UAO’s benefit. They are aware of the upcoming FDOT projects and that any placements within this permit will be relocated at the UAO’s cost in coordination with the proposed upcoming road improvement project 440063-1.
• Please provide certified as-built data on the approved submitted FDOT plan sets of City of Inverness underground installations, within 45 days after completion. (ie. Elevation, offsets, & stationing)
Upon Final execution of this permit, please forward the District Utilities’ copy to the Construction office indicated above with a copy of this memo attached.

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

PATH=Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\051-01 SOUTH 301 W-WW PIPELINES\DESIGN&CONSTRUCTION\CAD\DWGS\GENERAL\2611005101-G01.DWG

© Jones Edmunds 2234

22x34

SOUTH 301 W
WATER AND WASTEWATER PIPELINES

CITY OF ZEPHYRHILLS, FLORIDA

PREPARED FOR:

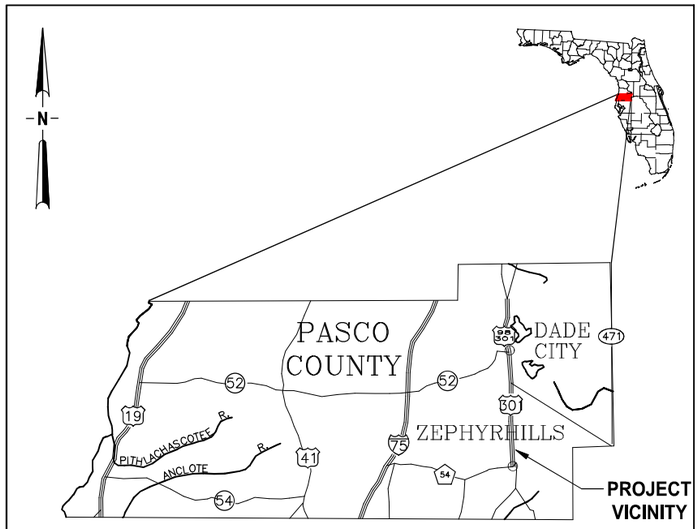
THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH ACIE FRASER, P.E. ON DATE ADJACENT TO SEAL.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED, THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

JONES EDMUNDS
8657 BAYPINE ROAD, SUITE 300
JACKSONVILLE, FL 32256
CERTIFICATE OF AUTHORIZATION #1841
E.O.R.: KENNETH ACIE FRASER, P.E., No. 57452

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING DIVISIONS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.:
GENERAL, CIVIL, EROSION CONTROL

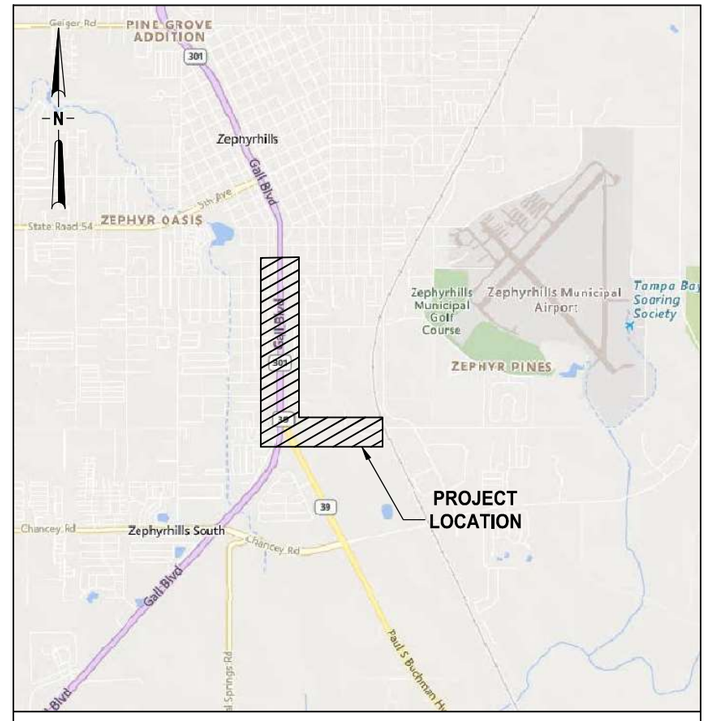
KENNETH ACIE FRASER
LICENSE
No. 57452
STATE OF
FLORIDA
PROFESSIONAL ENGINEER



SITE VICINITY MAP

PREPARED BY:

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
324 S. HYDE PARK AVE., SUITE 250 TAMPA, FLORIDA 33606 / (813) 258-0703



PROJECT LOCATION

PROJECT # 26110-051-01

SEPTEMBER 2023

BID DOCUMENTS

Approved
2023.11.798.00197
James A. Meyer
11/6/2023

LAST SAVED: 9/25/2023 8:31 AMBY:KFRASER PLOTTED:9/25/2023 08:41 AMBY:KENNETH A. FRASER, PE

© Jones Edmunds 2234

GENERAL NOTES

REFERENCED DATA

1. TOPOGRAPHIC SURVEY PERFORMED BY DC JOHNSON AND ASSOCIATES, 11911 SOUTH CURLEY ST. SAN ANTONIO, FL 33576 A LICENSED PROFESSIONAL LAND SURVEYOR, DATED 3/09/2023.

2. THE SURVEY INFORMATION CONTAINED HEREIN WAS OBTAINED FOR DESIGN PURPOSES AND MAY NOT BE AN ADEQUATE REPRESENTATION OF ACTUAL CONDITIONS FOR PROJECT CONSTRUCTION. ANY EXISTING CONTOURS SHOWN REPRESENT INTERPOLATIONS/EXTRAPOLATIONS FROM THE BEST AVAILABLE SURVEY DATA. ALL RISKS RESULTING FROM THE USE OR INTERPRETATION OF THE SURVEY DATA SHOWN SHALL BE BORNE BY THE CONTRACTOR.

GENERAL

3. THE CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS AND REQUIREMENTS OF ALL PERMITS (FDEP, FDOT, PASCO COUNTY BUILDING DEPARTMENT, ETC) OBTAINED FOR THIS PROJECT.

4. THE CONTRACTOR IS ADVISED NOT TO SCALE FROM DRAWINGS BUT TO FIELD VERIFY ALL DIMENSIONS. THE DIMENSIONS OF SPECIFIED AND FURNISHED PRODUCTS AND MATERIALS TAKE PRECEDENCE OVER DIMENSIONS INDICATED ON THE DRAWINGS. IF SIGNIFICANT DEVIATIONS OCCUR, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 72 HOURS PRIOR TO CONSTRUCTION FOR A DETERMINATION AND RESOLUTION.

5. THE CONTRACTOR SHALL VERIFY THAT ALL CLEARANCES CAN BE MET. IF ANY CLEARANCES CANNOT BE MET, THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IN WRITING A MINIMUM OF 15 WORKING DAYS PRIOR TO CONSTRUCTING AND SUCH ITEM.

CONSTRUCTION LAYOUT/LIMITS OF CONSTRUCTION

6. THE CONTRACTOR SHALL OBTAIN THE SERVICES OF A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF FLORIDA FOR LAYOUT AND ESTABLISHMENT OF ELEVATIONS OF NEW WORK. PROOF OF LICENSE SHALL BE SUBMITTED TO THE ENGINEER BEFORE BEGINNING LAYOUT.

7. NO DISTURBANCE SHALL BE ALLOWED OUTSIDE OF THE RIGHT OF WAYS AND/OR THE LIMITS OF CONSTRUCTION SHOWN ON THE DRAWINGS UNLESS APPROVED BY THE OWNER OR SPECIFICALLY NOTED ON THE DRAWINGS.

EXISTING CONDITIONS

8. LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES ARE SHOWN BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE DRAWINGS BUT ARE NOT PURPORTED TO BE ABSOLUTELY CORRECT. THERE MAY BE OTHER IMPROVEMENTS, UTILITIES, ETC. WHICH ARE WITHIN THE PROJECT AREA. CONTRACTOR SHALL VERIFY, PRIOR TO CONSTRUCTION, THE LOCATIONS, ELEVATIONS, DIMENSIONS, TYPES, AND CONDITIONS OF ALL EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (WHETHER OR NOT SHOWN ON THE DRAWINGS) AFFECTING THE WORK.

9. PRIOR TO SHOP DRAWING PREPARATION AND SUBMITTAL AND PURCHASE OF RELATED MATERIALS, THE CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITIES (LOCATION, SIZE, MATERIALS OF CONSTRUCTION, OUTSIDE DIAMETER, WALL THICKNESS, ROUNDNESS, ELEVATIONS, ETC.) TO WHICH CONNECTION(S) WILL BE MADE. CONTRACTOR SHALL INCLUDE FIELD MEASUREMENTS ON SHOP DRAWINGS.

10. THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IN WRITING IMMEDIATELY IF CONFLICTS BETWEEN THE DRAWINGS AND ACTUAL CONDITIONS ARE DISCOVERED. THE CONTRACTOR SHALL ACCURATELY RECORD ANY SUCH CONFLICTS ON THE RECORD DRAWINGS.

11. ANY PROPERTY CORNERS, MONUMENTS, OR BENCH MARKS WITHIN THE PROJECT AREA SHALL BE PROTECTED UNLESS OTHERWISE INDICATED FOR DEMOLITION. IF ANY SUCH ITEMS ARE IN DANGER OF DAMAGE OR HAVE BEEN DAMAGED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER IMMEDIATELY AND REPLACE/RESTORE THESE ITEMS AT NO ADDITIONAL COST TO THE OWNER. IF OWNER CHOOSES TO SELF PERFORM THE WORK OR INCURS RELATED EXPENSES, THE CONTRACTOR SHALL REIMBURSE THE OWNER FOR ALL COSTS ASSOCIATED WITH THE EFFORT.

UTILITY COORDINATION

12. THE CONTRACTOR SHALL NOTIFY ALL UTILITIES NEAR THE PROJECT AREA AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE NOTIFYING "SUNSHINE 811 CALL OF FLORIDA" AT LEAST 48 HOURS PRIOR TO ANY DIGGING WORK TO HAVE ALL EXISTING UTILITIES LOCATED. THE PHONE NUMBER IS 1-800-432-4770 AND THE WEB SITE IS WWW.SUNSHINE811.COM, IN INSTANCES WHERE DIGGING OCCURS IN WETLANDS, THE NOTIFICATION PERIOD SHALL BE INCREASED FROM AT LEAST 48 HOURS TO AT LEAST 10 DAYS.

13. FLORIDA LAW (FS 553.851) REQUIRES THAT PERSONS MAKING EXCAVATIONS IN PUBLIC STREETS, ALLEYS, RIGHT-OF-WAYS OR UTILITY EASEMENTS MUST FIRST OBTAIN INFORMATION ON LOCATIONS OF UNDERGROUND GAS PIPELINES.

14. THE CONTRACTOR SHALL PRESERVE AND MAINTAIN EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES WITHIN THE PROJECT AREA. ANY DAMAGE SHALL BE REPAIRED BY AND AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.

15. THE CONTRACTOR IS RESPONSIBLE FOR BRACING, SHORING, OR PROVIDING OTHER MEANS NECESSARY TO PROTECT AND SUPPORT EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (EXPOSED OR UNEXPOSED) THAT MAY BE IMPACTED BY THE CONTRACTOR'S WORK.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING POWER/TELEPHONE COMPANIES AND ARRANGING TO HAVE UTILITIES POLES HELD AND/OR GUY WIRES REMOVED AND REPLACED, IF NECESSARY FOR CONSTRUCTION, AT NO ADDITIONAL COST TO THE OWNER.

SAFETY

17. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE FAMILIAR WITH THE OSHA EXCAVATION SAFETY STANDARDS AND TO ABIDE BY THEM AS COVERED UNDER THE FLORIDA TRENCH SAFETY ACT.

18. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION SAFETY.

RESTORATION

19. ALL PAVING, STABILIZED EARTH, DRIVEWAYS, CURBS, SIDEWALKS, FENCES, SOD, LANDSCAPING, CULVERTS, ETC. DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE RESTORED BY AND AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.

ACCESS/MAINTENANCE OF FACILITIES

20. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL EXISTING UTILITIES/FACILITIES AND MAINTAIN UNINTERRUPTED SERVICES THROUGHOUT THE CONTRACT PERIOD.

PIPING NOTES

21. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS. CONTRACTOR SHALL TAKE CARE TO PROVIDE PROPER GRADE ELEVATIONS AND ALIGNMENTS.

22. SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE. TYPE OF JOINT AND FITTING MATERIAL SHALL BE AS SPECIFIED FOR THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE.

23. CONTRACTOR SHALL CONSTRUCT NEW BELOW GRADE PIPING WITH A MINIMUM COVER OF 36". IF A MINIMUM COVER OF 36" CANNOT BE ACHIEVED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING.

24. CONTRACTOR SHALL INSTALL MINIMUM OF 1/4" THICK NEOPRENE PADDING BETWEEN PIPE AND SUPPORTS FOR DUCTILE IRON PIPE AND PIPE WITH COATINGS.

UTILITY SEPARATION

25. EACH PROPOSED UTILITY SHALL BE LAID TO ACHIEVE THE MINIMUM HORIZONTAL SEPARATION BETWEEN IT AND OTHER UTILITIES IN ACCORDANCE WITH THE TYPICAL UTILITY HORIZONTAL SEPARATION DETAIL AND FDEP REQUIREMENTS.

26. AT LOCATIONS WHERE A PROPOSED UTILITY CROSSES ANOTHER UTILITY, THE PROPOSED UTILITY SHALL BE INSTALLED IN ACCORDANCE WITH THE TYPICAL UTILITY CONFLICT DETAIL AND FDEP REQUIREMENTS.

27. IN THE EVENT THAT A UTILITY CONFLICT CAN NOT BE RESOLVED BY MAKING A MINOR ROUTE ADJUSTMENT OR BY UTILIZING THE TYPICAL UTILITY CONFLICT DETAIL, THE CONTRACTOR SHALL SUBMIT A RELOCATION PLAN TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCING WORK. ALL RELOCATION EFFORTS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER AND ANY AFFECTED UTILITY COMPANIES.

PROJECT SPECIFIC

28. ALL UTILITIES SHALL BE KEPT IN OPERATION EXCEPT WITH THE WRITTEN CONSENT OF THE UTILITY OWNER.

29. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING EXISTING UTILITIES AND PAVEMENT THAT THE CONTRACTOR DAMAGES DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER. REPAIRS SHALL BE CONDUCTED UNDER THE SUPERVISION OF THE OWNER AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND THESE DRAWINGS.

30. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF TWO WEEKS NOTICE TO THE OWNER PRIOR TO CONNECTING THE NEW CONSTRUCTION, EQUIPMENT, AND PIPING TO THE CITY OF ZEPHYRHILLS WWTF. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND SCHEDULING EACH CONNECTION WITH THE OWNER TO ENSURE THAT THERE ARE MINIMAL INTERRUPTIONS TO EACH SYSTEM.

31. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AND STABILIZING POWER POLES DURING CONSTRUCTION. THE CONTRACTOR SHALL CONTACT THE ELECTRIC UTILITY PROVIDER AND COORDINATE WITH THEM.

32. CONTRACTOR SHALL REMOVE TREE(S) WHEN IN DIRECT CONFLICT W/ PROPOSED WORK, AS APPROVED BY THE ENGINEER. CONTRACTOR SHALL OBTAIN PERMIT(S) REQUIRED.

33. PLEASE NOTE EXISTING UTILITIES AS SHOWN IN THE DRAWINGS ARE BASED ON AVAILABLE GIS DATA. CONTRACTOR SHALL VERIFY EXISTING UTILITIES LOCATIONS PRIOR TO CONSTRUCTION.

SPECIAL REQUIREMENTS TO HAND-DIG EXCAVATIONS FOR EXISTING UTILITY COORDINATION

34. PLEASE NOTE AREAS OF EXISTING UTILITIES IN CLOSE PROXIMITY TO THE PROPOSED INSTALLATION HAVE BEEN NOTED WITH DASHED RECTANGULAR BOXES SHOWN IN THE PLANS.

35. IN THE NOTED AREAS AND OTHER AREAS IDENTIFIED DURING CONSTRUCTION, THE CONTRACTOR SHALL HAND DIG ALL EXCAVATIONS WITHIN 10 FEET IN ALL DIRECTIONS OF A MARKED LOCATED UTILITY LINE.

36. THE CONTRACTOR SHALL ALSO HAND DIG A PILOT TRENCH WHEN CALLED FOR ON THE DIG PERMIT FOR ALL UNDERGROUND UTILITY WORK ALONG THE CENTERLINE OF NEW TRENCHES AND DOWN TO THE BOTTOM ELEVATION OF THE NEW UTILITY.

37. MACHINE EXCAVATION SHALL PROCEED ONLY AFTER IT IS DETERMINED THAT ALL EXISTING UTILITIES HAVE BEEN IDENTIFIED AND PROTECTED.

SOIL CONTAMINATION AREA

38. ONE AREA OF SOIL CONTAMINATION IS IDENTIFIED ON THE PLANS ON SHEET C8. AS A MINIMUM, THECONTRACTOR SHALL WEAR PPE WHEN WORKING IN SOIL OR GROUNDWATER IN THE AREA NOTED.

39. SOIL THAT IS DISTURBED SHALL NOT BE TAKEN OFF SITE. SOIL SHALL BE PLACED BACK WITHIN THE PROJECT BOUNDARY.

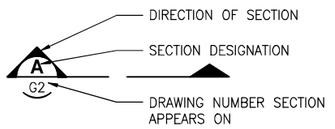
40. IN THE EVENT DEWATERING IS REQUIRED FOR THE INSTALLATION, THE CONTRACTOR SHALL CONFORM TO ENVIRONMENTAL REGULATIONS FOR THE PUMPING AND DISPOSAL OF GROUNDWATER FOR THE INSTALLATION. DEWATERING PLANS AND PERMITS SHALL INCLUDE A DETAILED SITE PLAN AND SHALL BE SUBMITTED TO THE OWNER PRIOR TO ANY WORK BEING PERFORMED IN AREAS WITH GROUNDWATER CONTAMINATION.

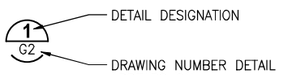
HORIZONTAL DIRECTIONAL DRILL NOTES

41. BORING LAYOUT BASED ON MINIMUM RADIUS OF 400 FEET. MAXIMUM BACK REAMER DIAMETERS SHALL BE
    19.8-INCH FOR 12-INCH DR-11 HDPE PIPE
    13.6-INCH FOR 6-INCH DR-11 HDPE PIPE

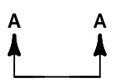
42. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNERS FOR ACCESS DURING UTILITY INSTALLATION.

43. BORE DEPTH ON BORES BENEATH FDOT ROADWAY PAVEMENT SHALL BE 10X THE BACK REAMER SIZE PER UAM 3.16.9.1.



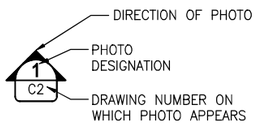


SECTION DESIGNATION



INDICATES ONE OR MORE SECTIONS CUT SHOWN ON THE SAME DETAIL

DETAIL DESIGNATION



SECTION DESIGNATION

PHOTO DESIGNATION

DRAWING INDEX

DWG. NO.	SHEET DESCRIPTION
GENERAL	
G1	COVER SHEET
G2	DRAWING INDEX, GENERAL NOTES AND DESIGNATION
G3	ABBREVIATIONS
G4	LEGENDS AND PIPE SCHEDULE
G5	SURVEY LEGEND AND NOTES
G6	KEY MAP
FORCEMAIN	
C1	FORCEMAIN PLANS
C2	FORCEMAIN PLANS
C3	FORCEMAIN PLANS
C4	FORCEMAIN PLANS
C5	FORCEMAIN PLANS
C6	FORCEMAIN PLANS
C7	FORCEMAIN PLANS
C8	FORCEMAIN PLANS
C9	FORCEMAIN PLANS
C10	FORCEMAIN PLANS
C11	FORCEMAIN PLANS
C12	FORCEMAIN PLANS
C13	FORCEMAIN PLANS
C14	FORCEMAIN PLANS
C15	FORCEMAIN PLANS
WATERMAIN	
C16	WATERMAIN PLANS
C17	WATERMAIN PLANS
C18	WATERMAIN PLANS
C19	WATERMAIN PLANS
C20	WATERMAIN PLANS
C21	WATERMAIN PLANS
C22	WATERMAIN PLANS
C23	WATERMAIN PLANS
CIVIL DETAILS	
C24	CIVIL DETAILS
C25	CIVIL DETAILS
C26	CIVIL DETAILS
C27	CIVIL DETAILS
C28	CIVIL DETAILS
EROSION CONTROL	
EC1	STORMWATER POLLUTION PREVENTION DETAILS
EC2	STORMWATER POLLUTION PREVENTION DETAILS
EC3	STORMWATER POLLUTION PREVENTION DETAILS

BID DOCUMENTS

SAVED: 8/13/2023 11:26 AM SSIMS Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\051-01 SOUTH 301 W-WW PIPELINES\DESIGN&CONSTRUCTION\CAD\DWGS\GENERAL\26110051101-G02.DWG

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

DRAWING INDEX, GENERAL NOTES AND DESIGNATION

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH A. FRASER, PE #57452 ON THE DATE SHOWN ON THE COVER SHEET.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

PROJECT NO: 26110-051-01
DATE: SEPT 2023
INDEX NO:
DWG NO: G2

Approved 2023-R-798-00197 James A. Meyer 11/6/2023

PLOTTED: 9/22/2023 2:57:49 PM KENNETH A. FRASER, PE

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STANDARD ABBREVIATIONS

&	AND
@	AT
A	AUTOMATIC
AA STD	ALUMINUM ASSOCIATION STANDARD
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AB	ALIGNMENT BEGINNING
AC	ASBESTOS CEMENT
AC	ALTERNATING CURRENT
AC	AIR CONDITIONER
ACI	AMERICAN CONCRETE INSTITUTE
ADJ	ADJUSTABLE
AE	ALIGNMENT END
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIP	ABANDONED IN PLACE
AISI	AMERICAN IRON STEEL INSTITUTE
AIT	ANALYTICAL INDICATING TRANSMITTER
ALT	ALTERNATIVE
ALUM	ALUMINUM
AM	AUTO-MANUAL
AMPS	AMPERES
ANSI	AMERICAN NATION STANDARDS INSTITUTE
AP	ANALYZER PANEL
APP	APPROVE, APPROVED
APPROX	APPROXIMATE
AR	AIR RELEASE
ARV	AIR RELEASE VALVE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASD	ADJUSTABLE SPEED DRIVE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AVE	AVENUE
AWG	AMERICAN WIRE GUAGE
AWS	AMERICAN WELDING SOCIETY
AWWA	AMERICAN WATER WORKS ASSOCIATION
B	BORING
B/	BOTTOM OF
B/L	BASELINE OF CONSTRUCTION
BC	BARE COPPER
BF	BLIND FLANGE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BKR	BREAKER
BLD	BLIND
BLDG	BUILDING
BLVD	BOULEVARD
BM	BENCH MARK
BMP	BEST MANAGEMENT PRACTICE
BO	BLOW-OFF
BTM	BOTTOM
BTM/	BOTTOM OF
BV	BALL VALVE
BYP	BYPASS
C	CONDUIT, CONDUCTOR, CLOSE
C/L, CL	CENTERLINE
CAM	COMPUTER-AUTO-MANUAL
CAT	CATALOGUE
CB	CIRCUIT BREAKER
CC	CENTER TO CENTER
CCS	CENTRAL CONTROL SYSTEM
CF	COLUMN FOUNDATION
CFWE	CABLE FURNISHED WITH EQUIPMENT
CI	CAST IRON
CIP	CAST IN PLACE, CAST IRON PIPE
CISP	CAST IRON SLIP PIECE
CJ	CONSTRUCTION/CONTRACTION JOINT
CLF	CHAIN LINK FENCE
CLR	CLEAR
CM	COMPUTER-MANUAL
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
CO	COMPANY
COL	COLUMN
COM	COMMUNICATION
CON	CONCENTRIC
CONC	CONCRETE
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CORP	CORPORATION
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CRE	CORROSION RESISTANT
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
CS	CARBON STEEL
CT	CURRENT TRANSFORMER, CABLE TRAY CONTACTOR
CTRD	CENTERED
CV	CHECK VALVE
D	DRAIN
DB	DUCT BANK
DBI	DITCH BOTTOM INLET
DC	DIRECT CURRENT
DES	DESIGNATION
DET	DETAIL
DI	DUCTILE IRON
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DIPS	DUCTILE IRON PIPE SIZE
DIV	DIVISION
DN	DOWN, DAMPER
DR	DIMENSION RATIO
DWG	DRAWING
DXS	DOUBLE EXTRA STRONG
E	EAST(ING)
EA	EACH
ECC	ECCENTRIC
EES	EMERGENCY EYEWASH AND SHOWER
EF	EACH FACE, EXHAUST FAN
EG	SUCH AS
EJ	EXPANSION JOINT
EL, ELEV	ELEVATION
ELB	ELBOW
ELEC	ELECTRICAL
EOP	EDGE OF PAVEMENT
EQ	EQUAL
ERCP	ELLIPTICAL REINFORCED CONCRETE PIPE
EST	ELEVATED STORAGE TANK
ETC	ETCETERA
EW	EACH WAY
EXIST	EXISTING
FBC	FLORIDA BUILDING CODE
F, FU	FUSE
F/F	FINISHED FLOOR
FAB	FABRICATED
FAC	FLORIDA ADMINISTRATIVE CODE
FCA	FLANGED COUPLING ADAPTER
FCV	FLOW CONTROL VALVE
FDEP	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
FDN	FOUNDATION
FDOT	FLORIDA DEPARTMENT OF TRANSPORTATION
FDR	FEEDER
FE	FLOW ELEMENT
FF	FINISHED FLOOR
FFE	FINISHED FLOOR ELEVATION
FG	FINISHED GRADE, FIBERGLASS
FH	FIRE HYDRANT
FIG	FIGURE
FIN	FINISHED
FIT	FLOW INDICATING TRANSMITTER
FJ	FLANGED JOINT
FL	FLOOR
FLEX	FLEXIBLE
FLG	FLANGE(D)
FND	FOUNDATION
FNPT	FEMALE NATIONAL PIPE THREAD
FO	FIBER OPTIC
FOS	FAST-OFF-SLOW
FOSA	FAST-OFF-SLOW-AUTO
FOSR	FAST-OFF-SLOW-REMOTE
FP	FULL PENETRATION, FIELD PANEL
FR	FORWARD-REVERSE
FREQ	FREQUENCY
FRP	FIBER REINFORCED PLASTIC
FS	FLORIDA STATUTES, FAR SIDE, FLOW SWITCH
FT	FOOT
G	GROUND
GAL	GALLON
GALV	GALVANIZED
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERUPTER
GND	GROUND
GPM	GALLONS PER MINUTE
GR	GRADE
GRTG	GRATING
GS	GALVANIZED STEEL
GSP	GALVANIZED STEEL PIPE
GST	GROUND STORAGE TANK
GV	GATE VALVE
H	HIGH
HA	HAND AUGER
HD	HAND
HDD	HORIZONTAL DIRECTIONAL DRILL
HDNS	HARDNESS
HDPE	HIGH DENSITY POLYETHYLENE
HHWL	HIGH HIGH WATER LEVEL
HK	HOOK
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HR	HANDRAIL
HSP	HIGH SERVICE PUMP
HT	HEIGHT
HWL	HIGH WATER LEVEL
I&C	INSTRUMENTATION AND CONTROL
IC	INTERRUPTING CAPACITY
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
IF	INSULATED FLANGE
IJ	ISOLATION JOINT
INC	INCORPORATED
IPS	IRON PIPE SIZE
J, JB	JUNCTION BOX
JT	JOINT
KA	KILOAMPERES
KB	KNEE BRACE
KCMIL	THOUSAND CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT AMPERES
KW	KILOWATTS
KWH	KILOWATT HOUR
L	LOWER
LB, LBS	POUND(S)
LE	LEVEL ELEMENT
LEL	LOWER EXPLOSIVE LIMIT
LF	LINEAR FEET
LG	LONG
LIT	LEVEL INDICATING TRANSMITTER
LIU	LIGHT INTERFACE UNIT
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LLWL	LOW LOW WATER LEVEL
LOS	LOCKOUT STOP
LR	LONG RADIUS, LOCAL-REMOTE
LS	LIFT STATION
LSIG	LONG SHORT INSTANTANEOUS GROUND
LWL	LOW WATER LEVEL
M	MAGNETIC CONTACTOR COIL, MOTOR, MANUAL
M/F	MALE/FEMALE
MAX	MAXIMUM
MC	MODULATE-CLOSE
MCC	MOTOR CONTROL CENTER
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MES	MITERED END SECTION
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MNPT	MALE NATIONAL PIPE THREAD
MO	MOTOR OPERATOR
MP	METERING PUMP
MPH	MILES PER HOUR
MS	MOTOR STARTER
MSC	MANUFACTURER SUPPLIED CABLE
MT, MTD	MOUNT(ED)
MTL	METAL
MV	MEDIUM VOLTAGE
N	NORTH(ING), NEUTRAL, NORMAL
N/A	NOT APPLICABLE
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NC	NORMALLY CLOSED
NE	NORTH EAST
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NPT	NATIONAL PIPE THREAD
NPW	NON POTABLE WATER
NRS	NONRISING STEM
NS	NEAR SIDE
NSF	NATIONAL SANITATION FOUNDATION
NTS	NOT TO SCALE
NW	NORTH WEST
OC	ON CENTER(S), OPEN-CLOSE(D)
OCA	OPEN-CLOSE-AUTO
OCR	OPEN-CLOSE-REMOTE
OD	OUTSIDE DIAMETER
OF	OVERFLOW
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
OPP	OPPOSITE
ORP	OXIDATION REDUCTION POTENTIAL
OS&Y	OUTSIDE STEM AND YOKE
OSC	OPEN-STOP-CLOSE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
P&ID	PIPING AND INSTRUMENTATION DIAGRAM
P/L	PROPERTY LINE
PB	PULL BOX
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PCV	PRESSURE CONTROL VALVE
PE	PLAIN END, POLYETHYLENE
PET	POLYETHYLENE TUBING
PF	POWER FACTOR
pH	HYDROGEN ION CONCENTRATION
PH	PHASE
PI	POINT OF INTERSECTION/PLANT INFLUENT
PID	PROPORTIONAL INTEGRAL DERIVATIVE
PIT	PRESSURE INDICATING TRANSMITTER
PIV	POST INDICATOR VALVE
PL	PLATE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PLCS	PLACES
POC	POINT OF CONNECTION
POE	POINT OF ENTRY
POJ	PUSH ON JOINT
PP	POWER POLE
PPE	PERSONAL PROTECTIVE EQUIPMENT
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSID	POUNDS PER SQUARE INCH DIFFERENTIAL
PSIG	POUNDS PER SQUARE INCH GAUGE
PSV	PRESSURE SUSTAINING VALVE
PT	PRESSURE TREATED, POTENTIAL TRANSFORMER
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PW	POTABLE WATER
PWR	POWER
R	RADIUS
R/W, ROW	RIGHT-OF-WAY
RCP	REINFORCED CONCRETE PIPE
RCPT	RECEPTACLE
RED	REDUCER
REF	REFERENCE
REINF	REINFORCEMENT, REINFORCING
REQ, REQ'D	REQUIRED
RGS	RIGID GALVANIZED STEEL
RJ	RESTRAINED JOINT
RM	REMOTE MULTIPLEXING MODULE
RMS	ROOT MEAN SQUARE
RPZ	REDUCED PRESSURE ZONE
RT	RIGHT
RTU	REMOTE TELEMETRY UNIT
SARV	SURGE ANTICIPATOR RELIEF VALVE
SBC	STANDARD BUILDING CODE
SCH	SCHEDULE
SCJ	SAW CUT JOINT
SDI	STEEL DECK INSTITUTE
SE	SOUTH EAST
SEC	SECOND
SF	SLOWER-FASTER
SHEC	SHOULDERED-END COUPLING
SHT	SHEET
SIM	SIMILAR
SJI	STEEL JOINT INSTITUTE
SM	STATIC MIXER
SP	SPACING, SPACED
SPD	SURGE PROTECTIVE DEVICE
SQ	SQUARE
SR	STATE ROAD, SURGE RELIEF
SRV	SURGE RELIEF VALVE
SS	START-STOP
SS, SST	STAINLESS STEEL
SSC	SUPERVISORY SET POINT CONTROL
SSRV	SOLID STATE REDUCED VOLTAGE
ST	SHUNT TRIP
STA	STATION
STD	STANDARD
STL	STEEL
STS	STORMWATER SEWER
SW	SOUTH WEST, SWITCH
SWD	SIDE WATER DEPTH
SWJ	SOLVENT WELD JOINT
SWPPP	STORM WATER POLLUTION PREVENTION PLAN
SY	SQUARE YARD
T, THK	THICK
T/	TOP OF
T/B,T&B	TOP AND BOTTOM
TBM	TEMPORARY BENCHMARK
TEMP	TEMPERATURE
TGS	THREADED GALVANIZED STEEL
TGSP	THREADED GALVANIZED STEEL PIPE
TH	TOTAL HEAD
THERMO	THERMOSTATIC
THD	THREADED
TJB	TERMINAL JUNCTION BOX
TK	TANK
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TOSJ	TOP OF STEEL JOIST
TOW	TOP OF WALL
TS	TUBULAR STEEL
TSF	THICKENED SLAB FOOTING
TSP	TWISTED SHIELDED PAIR
TURB	TURBIDITY
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITER'S LABORATORIES
ULC	ULTRASONIC LEVEL CONTROLLER
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTAGE, VOLTS
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VH	VAPOR HEATER
VIB	VIBRATION
VIF	VERIFY IN FIELD
VP	VAPORIZER
W	WIDE, WATT
W/	WITH
W/O	WITHOUT
WCJ	WALL CONTROL JOINT
WF	WALL FOOTING
WGT	WEIGHT
WP	WORK POINT, WEATHERPROOF
WSE, WSEL	WATER SURFACE ELEVATION
WT	WEIGHT
WV	WATER VALVE
WWF	WELDED WIRE FABRIC
XFMR	TRANSFORMER
XS	EXTRA STRONG

CUSTOM ABBREVIATIONS

COZ	CITY OF ZEPHYRHILLS
SWFWMD	SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
ISO	ISOMETRIC
EOR	ENGINEER OF RECORD
FM	FORCE MAIN
WM	WATER MAIN

NOTES:
1. SEE LEGENDS AND PIPE SCHEDULE FOR ADDITIONAL ABBREVIATIONS.
2. NOT ALL ABBREVIATIONS MAY BE USED FOR THIS PROJECT.

BID DOCUMENTS

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DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

ABBREVIATIONS

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MECHANICAL LEGEND

CIVIL LEGEND

- CONTOURS (90)
- MATCHLINE
- RIGHT-OF-WAY BOUNDARY
- PROPERTY BOUNDARY
- EASEMENT BOUNDARY
- CENTERLINE
- WATERMAIN LINE (WM)
- FORCE MAIN (FM)
- GAS LINE (G)
- ELECTRICAL LINE (E)
- CHLORINE LINE
- SILT FENCE (SF)
- TURBIDITY BARRIER (TB)
- DEMO HATCH
- WETLAND (WL)
- SPOT ELEVATION (+100.00)
- REINFORCED CONCRETE PIPE (RCP)
- TRENCH DRAIN
- MITERED END SECTION W/ STRUCTURE DESIGNATION (S-1)
- FLARED END SECTION W/ STRUCTURE DESIGNATION (S-1)
- DITCH BOTTOM INLET W/ STRUCTURE DESIGNATION (S-1)
- COORDINATE POINT
- PROPOSED SIGN
- CONCRETE
- LIMEROCK
- COMPACTED SOIL
- GRAVEL
- ASPHALT RESTORATION
- FORCEMAIN FLOW DIRECTION
- POTENTIAL UTILITY CONFLICT

PIPING SYMBOLS

DOUBLE LINE	SINGLE LINE	
		PIPE
		WELDED PIPE
		FLANGED JOINT
		MECHANICAL JOINT OR RESTRAINED PUSH-ON JOINT
		FLEXIBLE COUPLING ADAPTER
		EXPANSION JOINT
		HUB & SPIGOT JOINT
		BALL JOINT
		FLANGED COUPLING ADAPTER W/ THRUST TIES
		FLEXIBLE COUPLING WITH THRUST TIES
		BLIND FLANGE
		ELBOW UP
		ELBOW DOWN
		TEE UP
		TEE DOWN
		FEMALE QUICK DISCONNECT FITTING
		MALE QUICK DISCONNECT FITTING

DOUBLE LINE	SINGLE LINE	
		LATERAL UP
		LATERAL DOWN
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		UNION
		CAP
		ANCHOR
		WYE
		TEE
		CROSS
		ELBOW, 90 DEGREE
		ELBOW, 45 DEGREE
		ELBOW, 22.5 DEGREE
		ABANDON IN PLACE
		DEMOLISH AND REMOVE

VALVE SYMBOLS

- GATE
- BUTTERFLY
- BALL
- CHECK
- DIAPHRAGM
- NEEDLE
- PRESSURE RELIEF
- AIR RELEASE AND/OR VACUUM RELIEF
- REGULATED SIDE HYDRAULIC CONTROL VALVE

ACTUATOR SYMBOLS

- M XX — ELECTRIC MOTOR
- EH XX — ELECTROHYDRAULIC
- P XX — PNEUMATIC
- H XX — HYDRAULIC
- S — SOLENOID
- MANUAL

NOTE:

ON LOSS OF PRIMARY POWER
(PNEUMATIC, ELECTRICAL OR HYDRAULIC)
XX: FO = FAIL OPEN
FC = FAIL CLOSED
FLP = FAIL TO LAST POSITION

PIPE SUPPORT SYMBOLS

- U-SHAPED PIPE SUPPORT
- FLANGED PIPE SUPPORT
- PIPE SUPPORT W/ AXIAL LOAD SUPPORT

PIPE SCHEDULE NOTES:

GENERAL NOTES:
1. COAT BURIED AND SUBMERGED PIPE PER PIPE SPECIFICATIONS.
2. TEST LINES PER SECTION 15144 UNLESS NOTED OTHERWISE.
3. LABEL ALL PIPING PER SECTION 15075.

RESTRAINT SYSTEM NOTES:
(1) SEE RESTRAINT DETAILS C24

SPECIFIC NOTES:
(A) DISINFECT PIPING PER SECTION 15141.
(B) APPLY ABOVE GRADE PAINT SYSTEM ONLY TO PIPING EXPOSED TO SUNLIGHT. PIPING UNDER FACILITY CANOPY STRUCTURE SHALL BE CLASSIFIED AS EXPOSED TO SUNLIGHT.
(C) BURIED DUCTILE IRON PIPE SHALL BE POLYETHYLENE WRAPPED PER SECTION 15155 PART 2.11.

PIPE SCHEDULE

ABBREVIATION	FLOW STREAM IDENTIFICATION	PIPE/DUCT MATERIAL	PIPE MATERIAL ABBREV	DIMENSION RATIO (DR)	SPECIFICATION NUMBER	PIPE LINING	NORMAL MAX OPERATING PRESSURE (PSIG)	FIELD TEST PRESSURE (PSIG)	EXPOSED PIPE PAINT SYSTEM	COLOR CODE	SPECIFIC NOTES	RESTRAINT SYSTEM NOTES
FM-1	FORCE MAIN	POLYVINYL CHLORIDE	PVC	18	15291	N/A		150	N/A	GREEN	N/A	(1)
FM-2	FORCE MAIN	DUCTILE IRON	DI	N/A	15155	EPOXY		150	N/A	GREEN	N/A	(1)
FM-3	FORCE MAIN	HIGH DENSITY POLYETHYLENE	HDPE	11	15146	N/A		160	N/A	GREEN	N/A	(1)
WM-1	WATER MAIN	POLYVINYL CHLORIDE	PVC	18	15291	N/A		150	N/A	BLUE	(A)	(1)
WM-2	WATER MAIN	HIGH DENSITY POLYETHYLENE	HDPE	11	15146	N/A		160	N/A	BLUE	(A)	(1)

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

LEGENDS AND PIPE SCHEDULE

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SURVEYOR'S NOTES:

1. USE OF THIS SURVEY FOR PURPOSES OTHER THAN INTENDED, WITHOUT WRITTEN VERIFICATION, WILL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO THE SURVEYOR. NOTHING HEREIN SHALL BE CONSTRUED TO GIVE ANY RIGHTS OR BENEFITS TO ANYONE OTHER THAN THOSE CERTIFIED TO. THIS SURVEY MEETS THE "STANDARDS OF PRACTICE" SET FORTH BY THE FLORIDA BOARD OF LAND SURVEYORS IN CHAPTER 5J-17 FLORIDA ADMINISTRATIVE CODE.
2. THIS SURVEY WAS PREPARED WITHOUT AN ABSTRACT OF TITLE; THEREFORE THE UNDERSIGNED MAKES NO GUARANTEES OR REPRESENTATIONS REGARDING INFORMATION SHOWN HEREON PERTAINING TO EASEMENTS, RIGHTS-OF-WAY, SETBACK LINES, AGREEMENTS, RESERVATIONS, OR OTHER SIMILAR MATTERS.
3. NO INSTRUMENTS OF RECORD REFLECTING EASEMENTS, RIGHT-OF-WAYS AND/OR OWNERSHIP WERE FURNISHED TO THE UNDERSIGNED EXCEPT AS SHOWN.
4. NO UNDERGROUND INSTALLATIONS, IMPROVEMENTS OR ENCROACHMENTS, HAVE BEEN LOCATED EXCEPT THOSE SHOWN HEREON.
5. ELEVATIONS SHOWN HEREON ARE BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), NATIONAL GEODETIC SURVEY BENCHMARK "D 663", LOCATED ALONG GALL BOULEVARD IN ZEPHYRHILLS, FL, PUBLISHED ELEVATION = 79.39' (NAVD88).
6. BEARINGS AND DISTANCES SHOWN HEREON ARE FIELD MEASURED, UNLESS OTHERWISE INDICATED.
7. THE TEXT FOR TIES TO IMPROVEMENTS INDICATES THE DIRECTION THEY LIE IN RELATION TO THE BOUNDARY.
8. SUBJECT PROPERTY MAY CONTAIN LANDS THAT ARE SUBJECT TO JURISDICTION OR RESTRICTION BY ONE OR MORE OF THE FOLLOWING AGENCIES: ARMY CORP. OF ENGINEERS, SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (S.W.F.W.M.D.) OR FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (F.D.E.P.).

SURVEYOR'S LEGEND

- IP, IR = IRON PIPE, IRON ROD
- R/W = RIGHT-OF-WAY
- EL. = ELEVATION
- I.E. = INVERT ELEVATION
- F.F. = FINISHED FLOOR ELEVATION
- RCP = REINFORCED CONCRETE PIPE
- CMP = CORRUGATE METAL PIPE
- = SET 5/8" IR "DC JOHNSON LB 4514"
- = SET NAIL & DISK "LB 4514"
- = VERTICAL CONTROL BENCHMARK
- = POWER POLE/TELEPHONE POLE
- = LIGHT POLE
- = METER POLE
- = GUY POLE
- = GUY ANCHOR
- = BOLLARD
- = POST
- = ROADSIGN
- = REFLECTOR SIGN
- = MAILBOX
- = AIR CONDITIONER
- MW = MONITORING WELL
- = CHAIN LINK FENCE
- = VINYL FENCE
- = WIRE FENCE
- = WOOD FENCE
- SPOT = SPOT ELEVATION
- = OAK TREE (SIZE AS NOTED)
- = PALM TREE (SIZE AS NOTED)
- = PINE TREE (SIZE AS NOTED)
- = TREE (UNKNOWN VARIETY)
- = WATER METER
- = GATE VALVE - WATER
- = BACKFLOW PREVENTER - WATER
- = WATER LINE WITNESS POST
- = FIRE HYDRANT
- = GATE VALVE - FIRE
- = UTILITY VAULT/HAND HOLE
- = ELECTRIC METER
- = ELECTRIC BOX
- OHP = OVERHEAD POWER LINE
- = GAS LINE WITNESS POST
- = GAS VALVE
- GAS = GAS LINE
- = TELEPHONE EQUIPMENT BOX
- = TELEPHONE PEDESTAL
- = TELEPHONE VAULT/HAND HOLE
- = TELEPHONE RELEASE VALVE
- = TELEPHONE LINE WITNESS POST
- OHT = OVERHEAD TELEPHONE LINE
- = FIBER OPTIC VAULT/HAND HOLE
- = FIBER OPTIC WITNESS POST
- = ASPHALT
- = CONCRETE
- = GRAVEL/DIRT ROAD

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

SURVEY LEGEND AND NOTES

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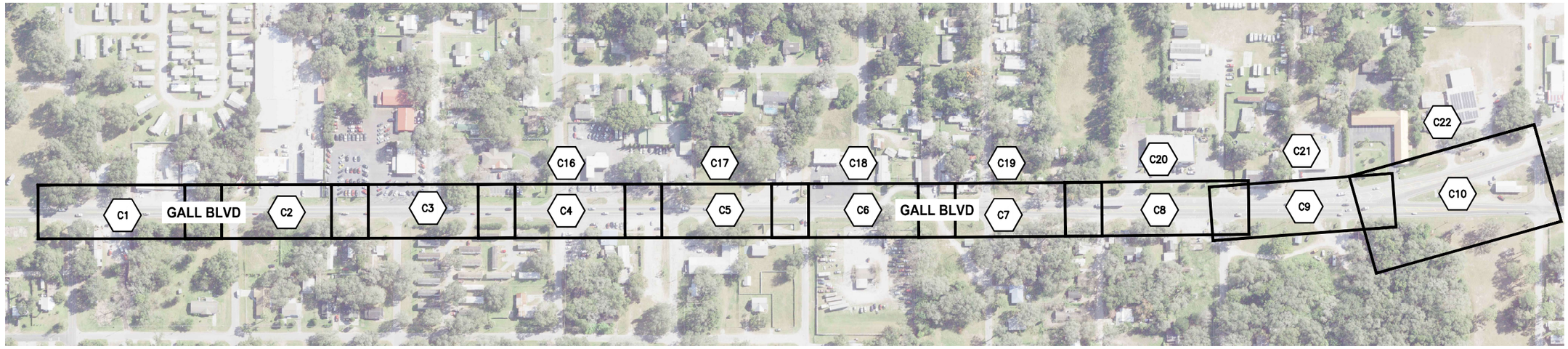
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

KEY MAP

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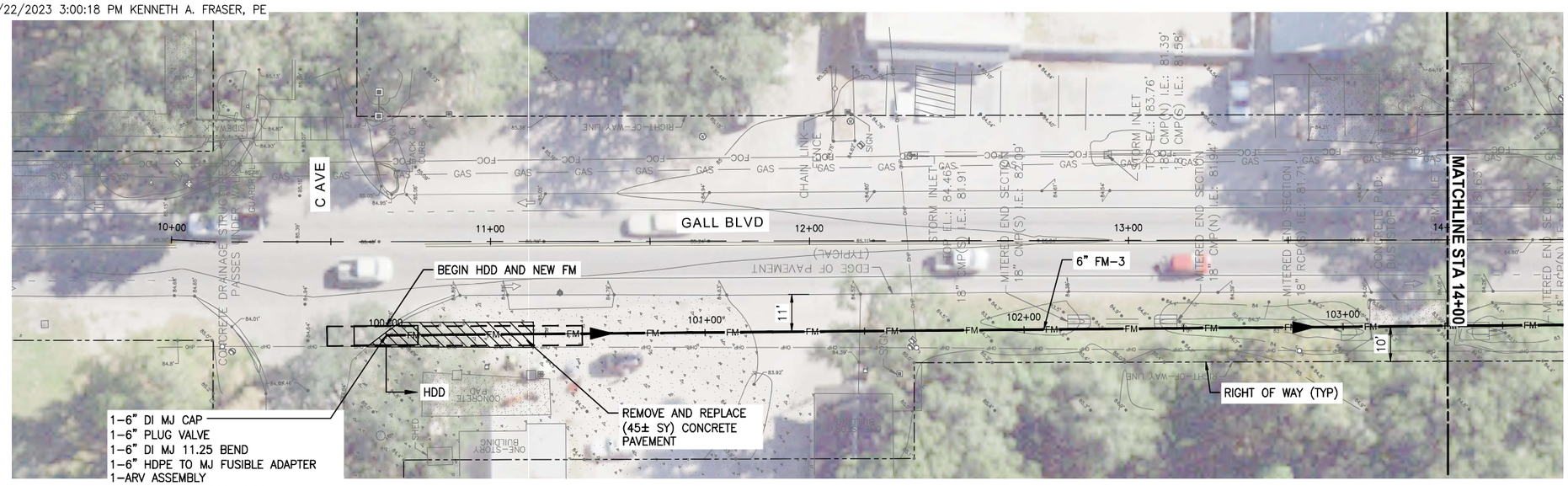
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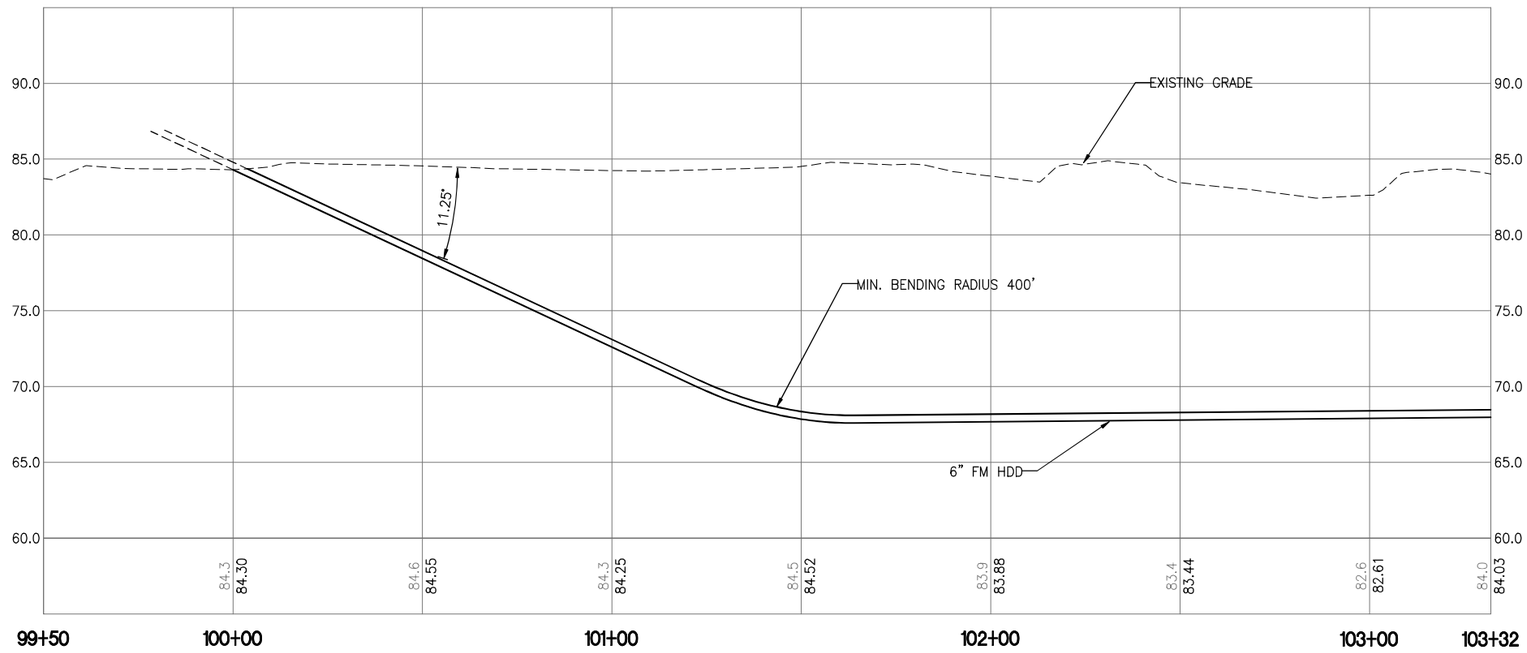
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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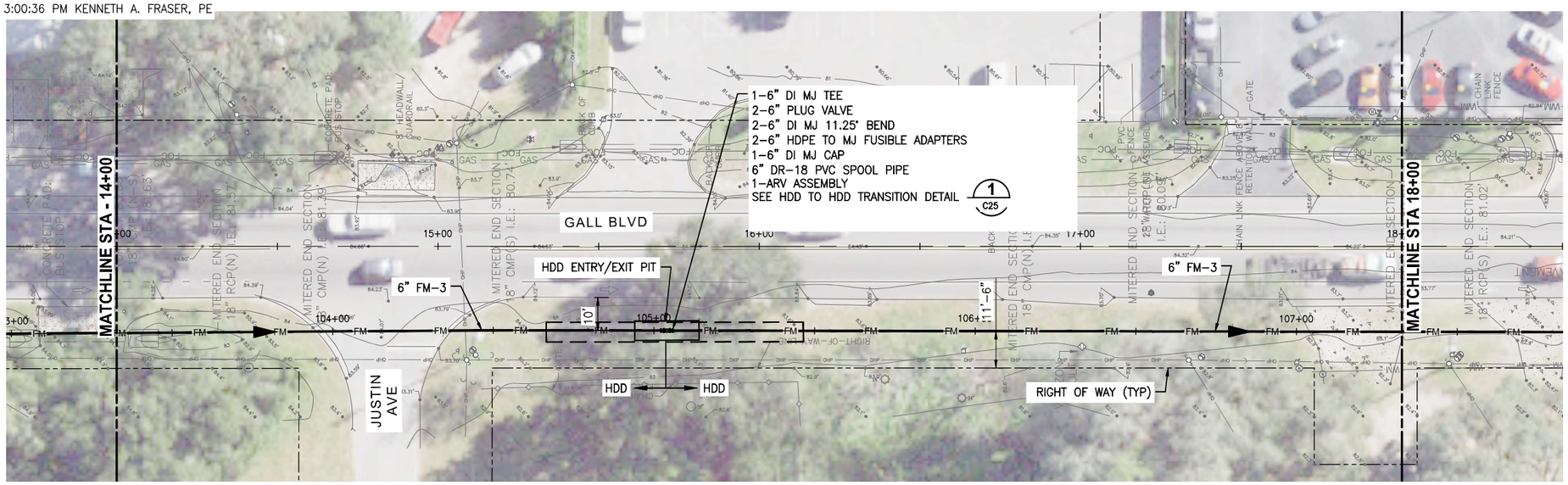
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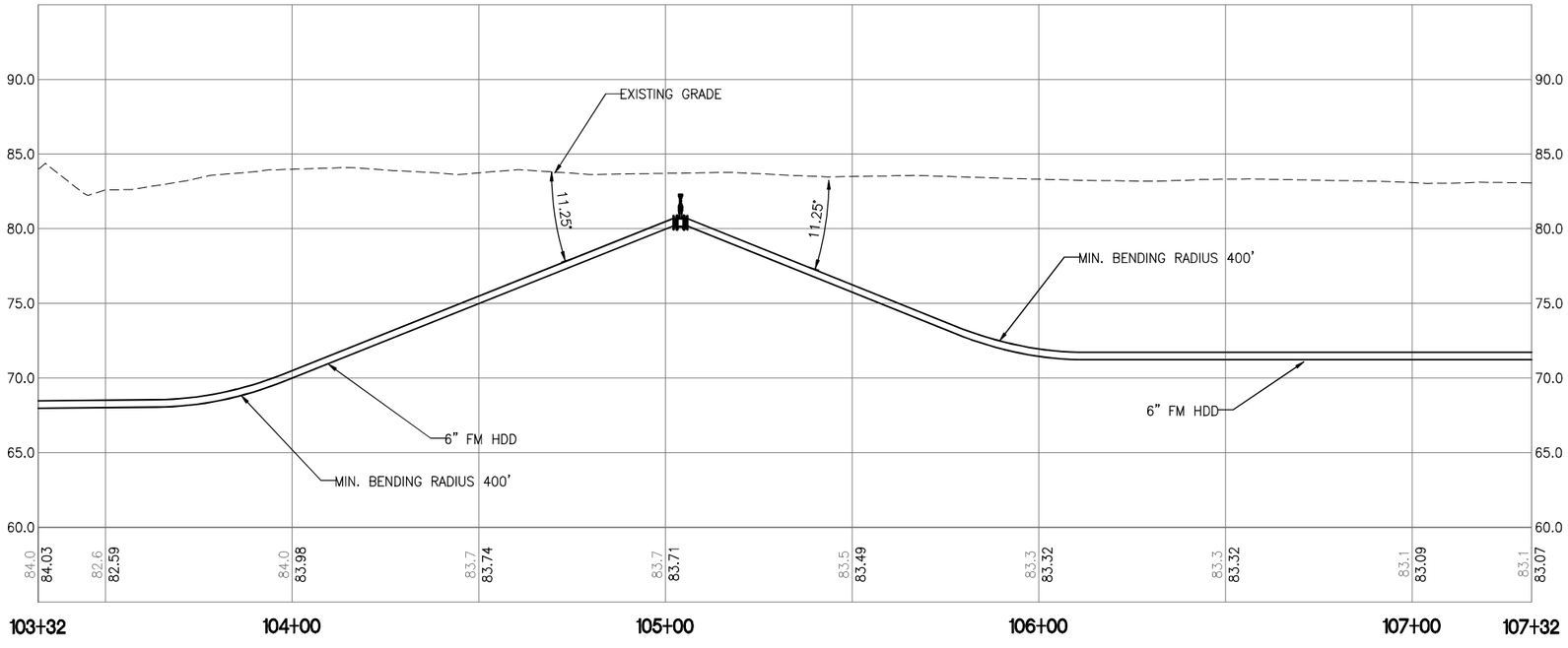
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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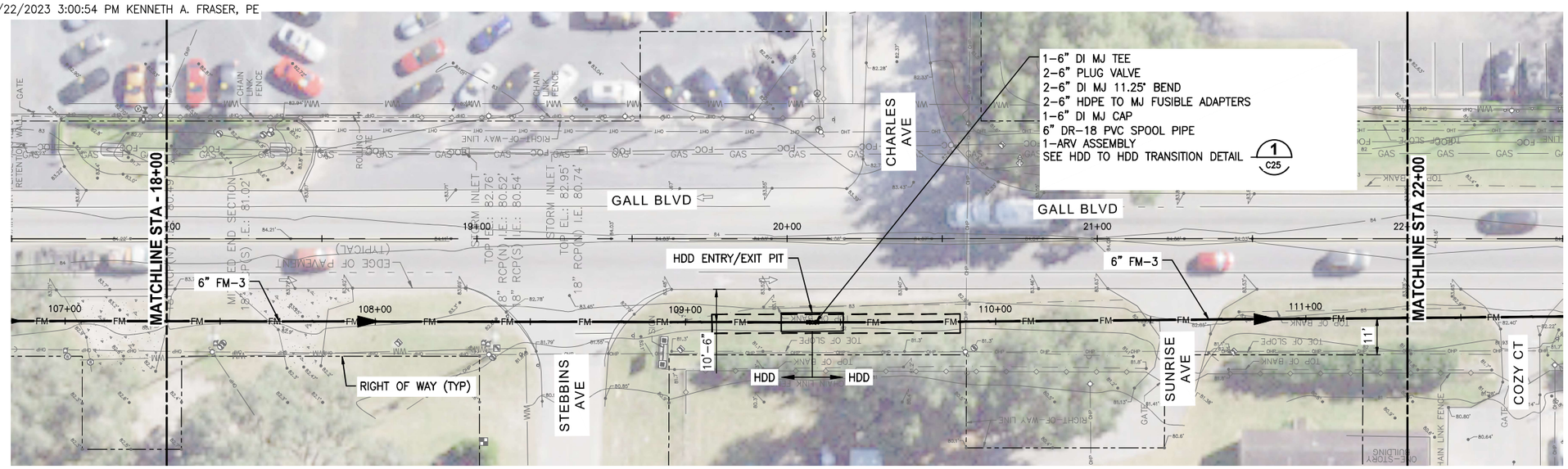
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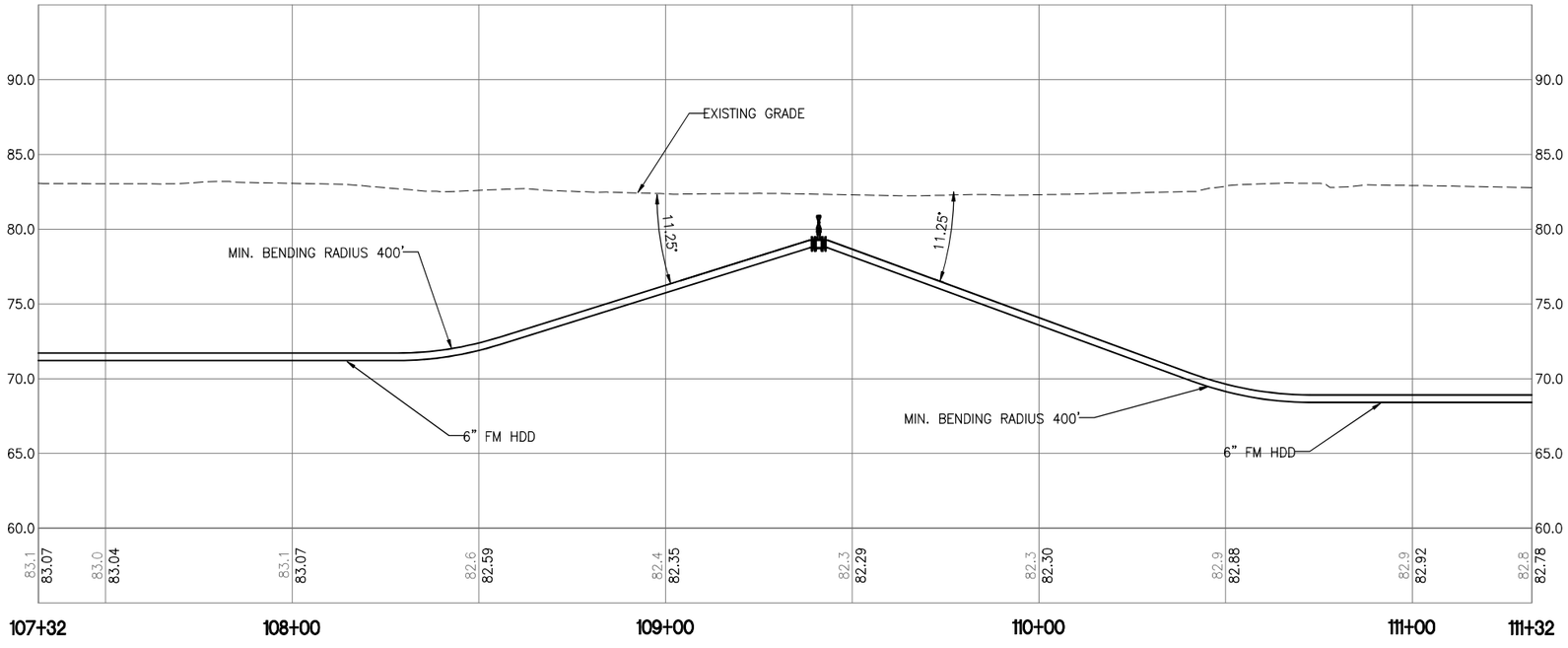
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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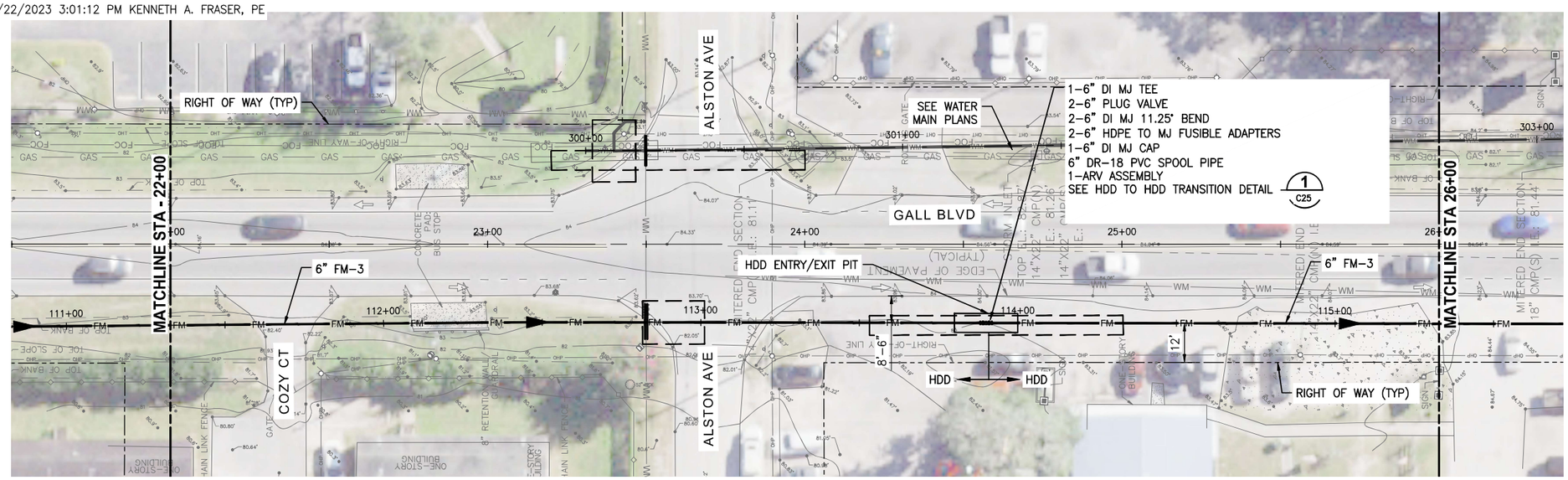
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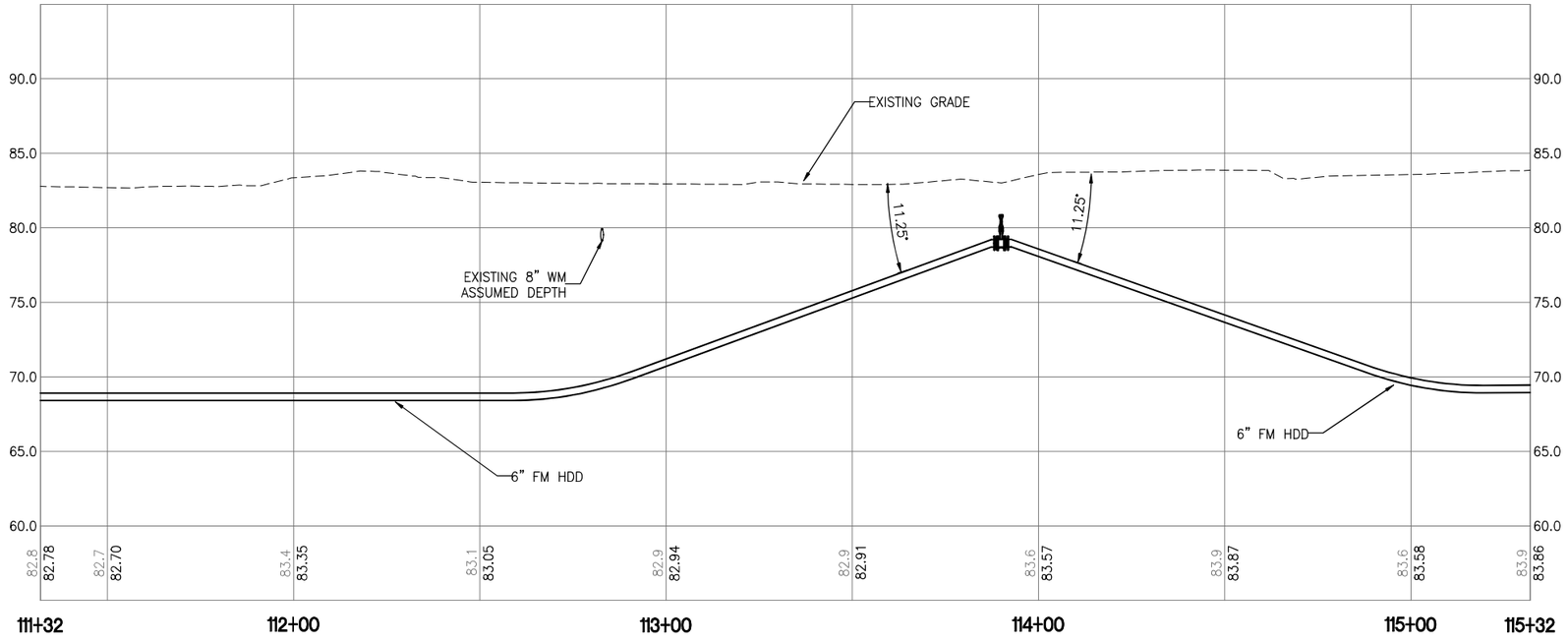
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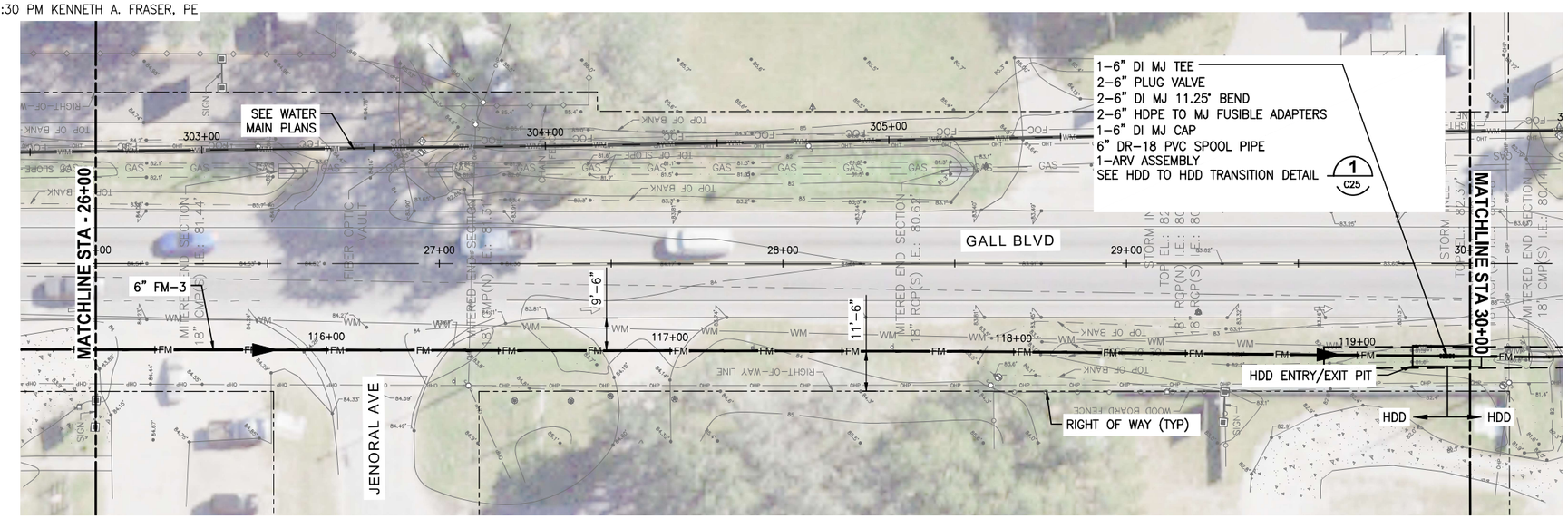
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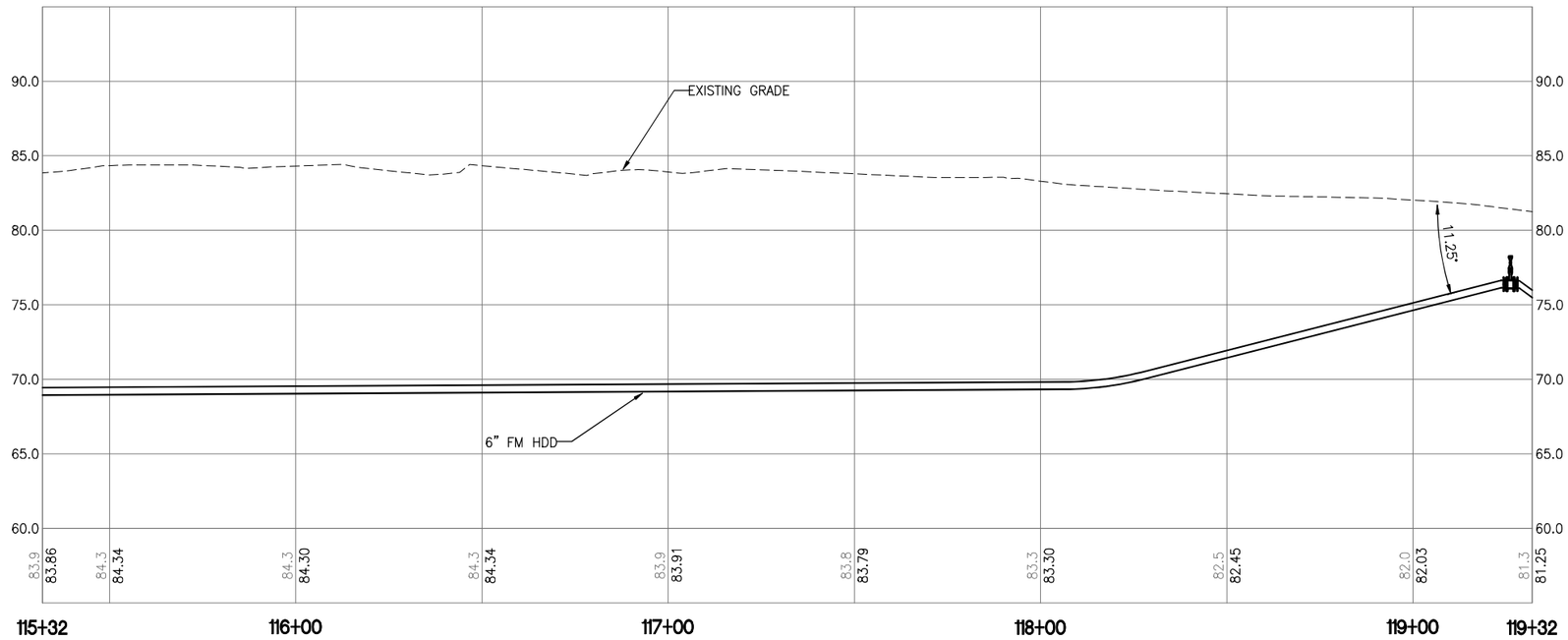
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DATE: SEPT 2023
INDEX NO:
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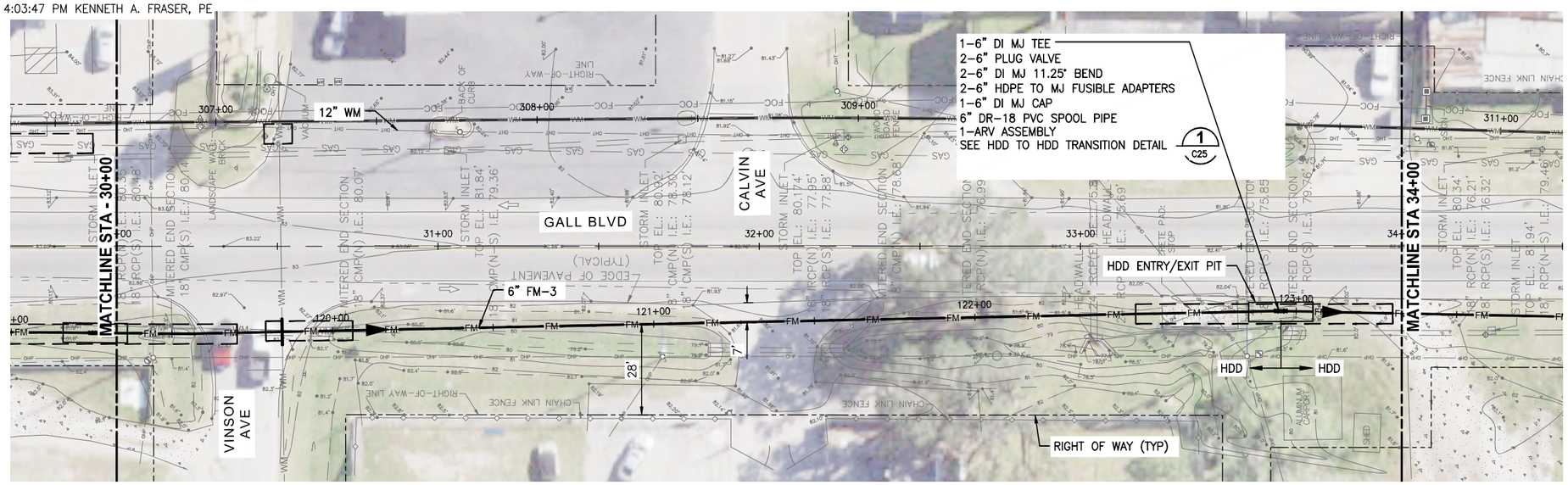
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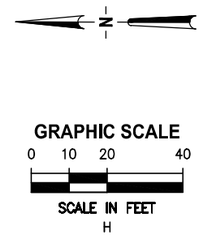
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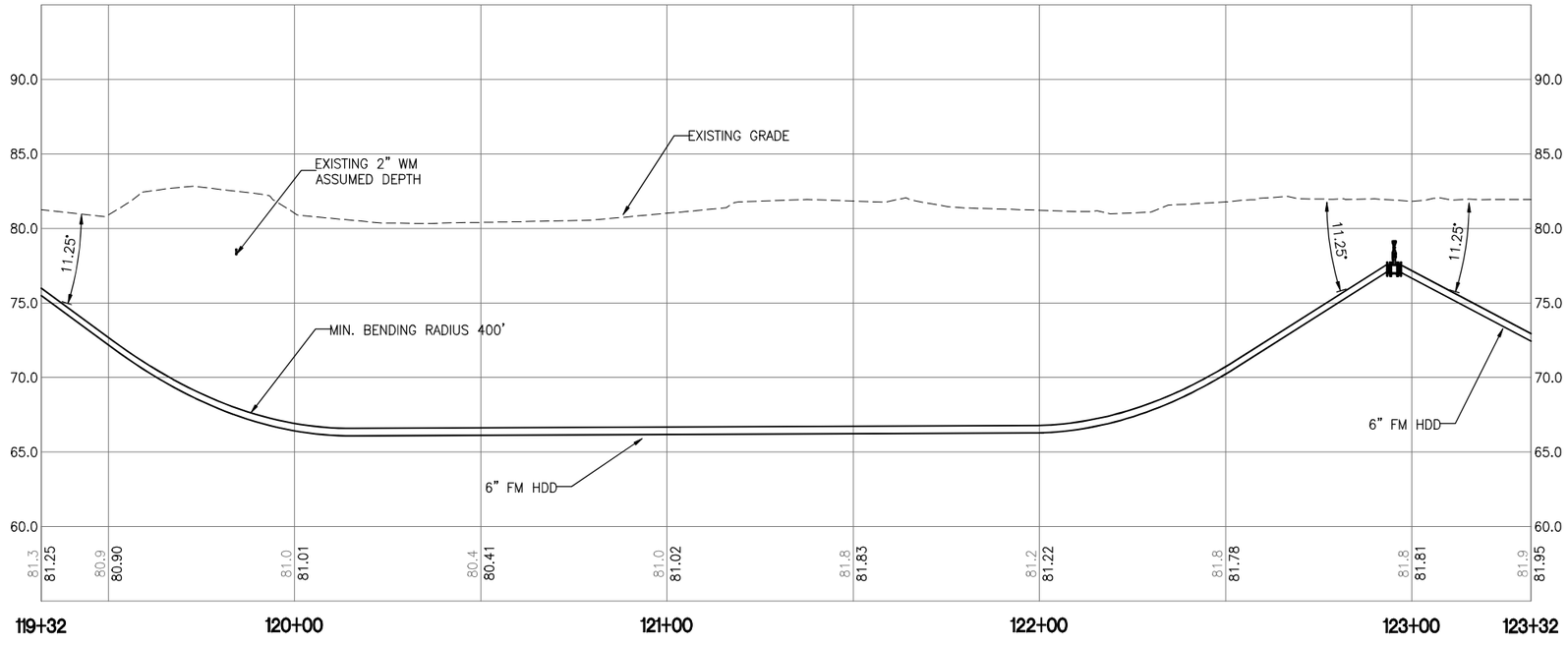
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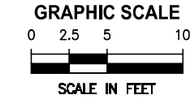
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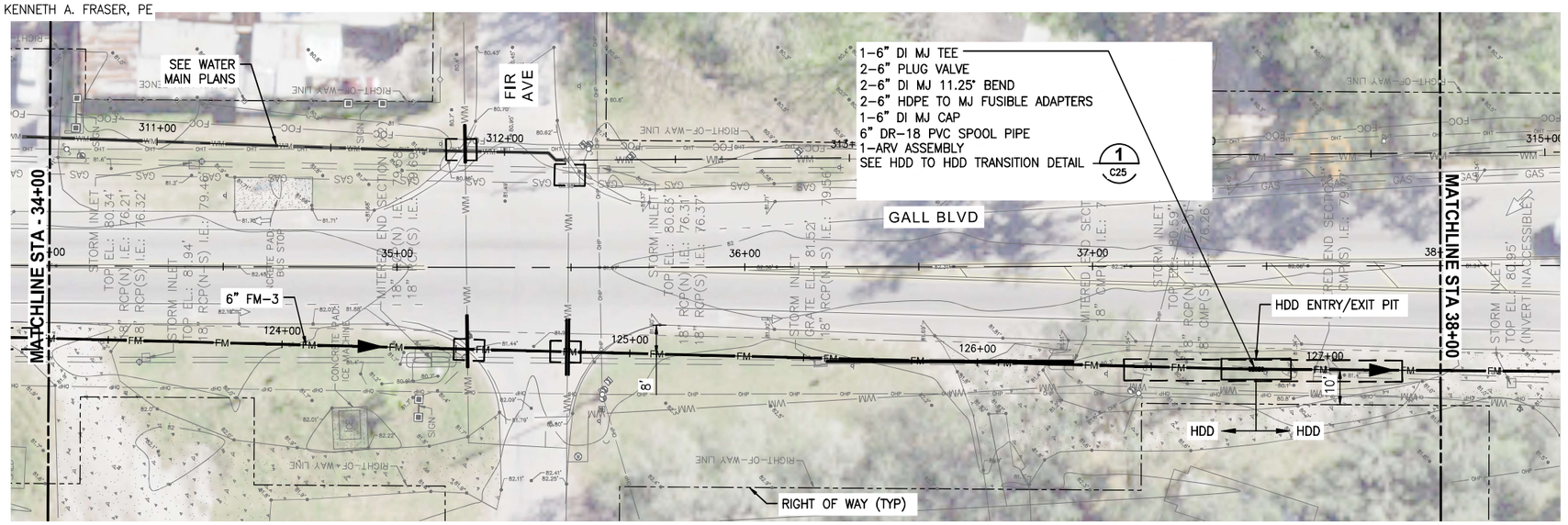
PROJECT NO: 26110-051-01
DATE: SEPT 2023
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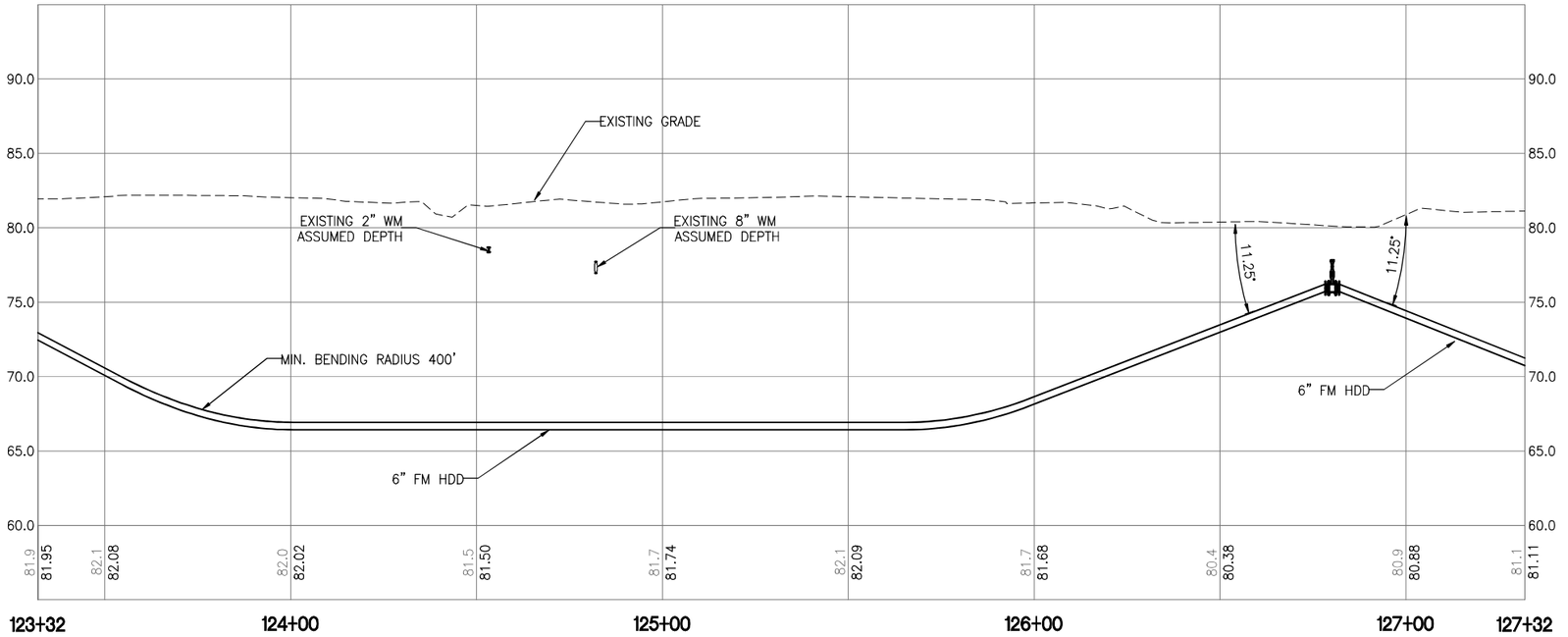
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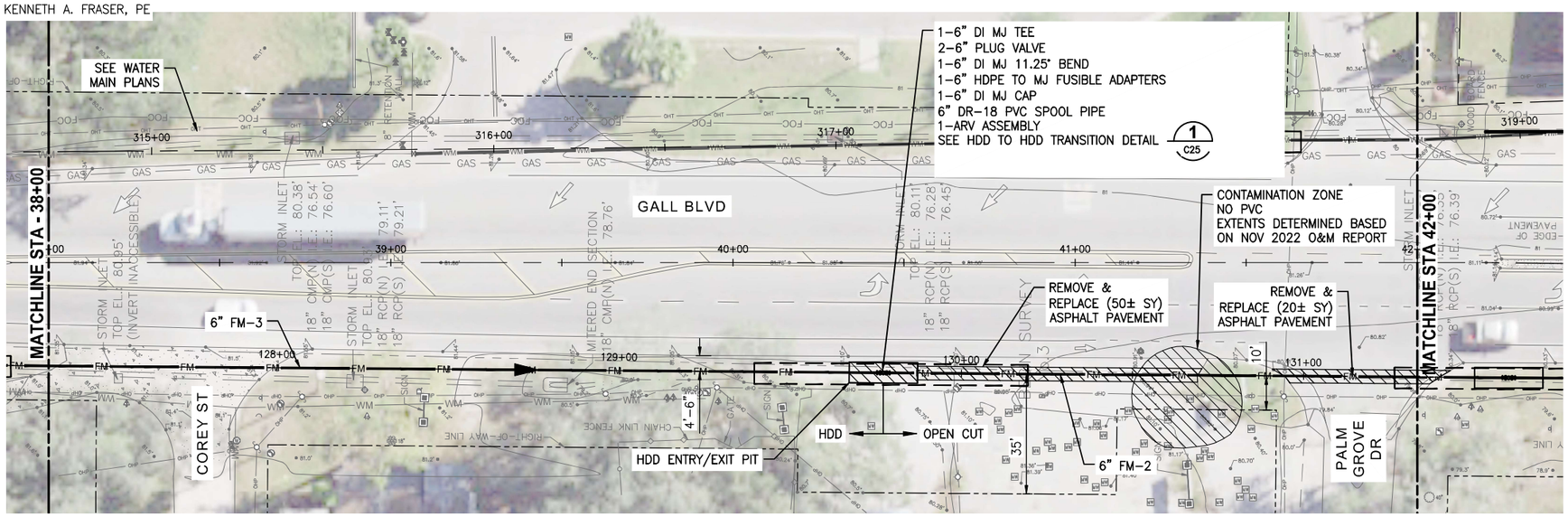
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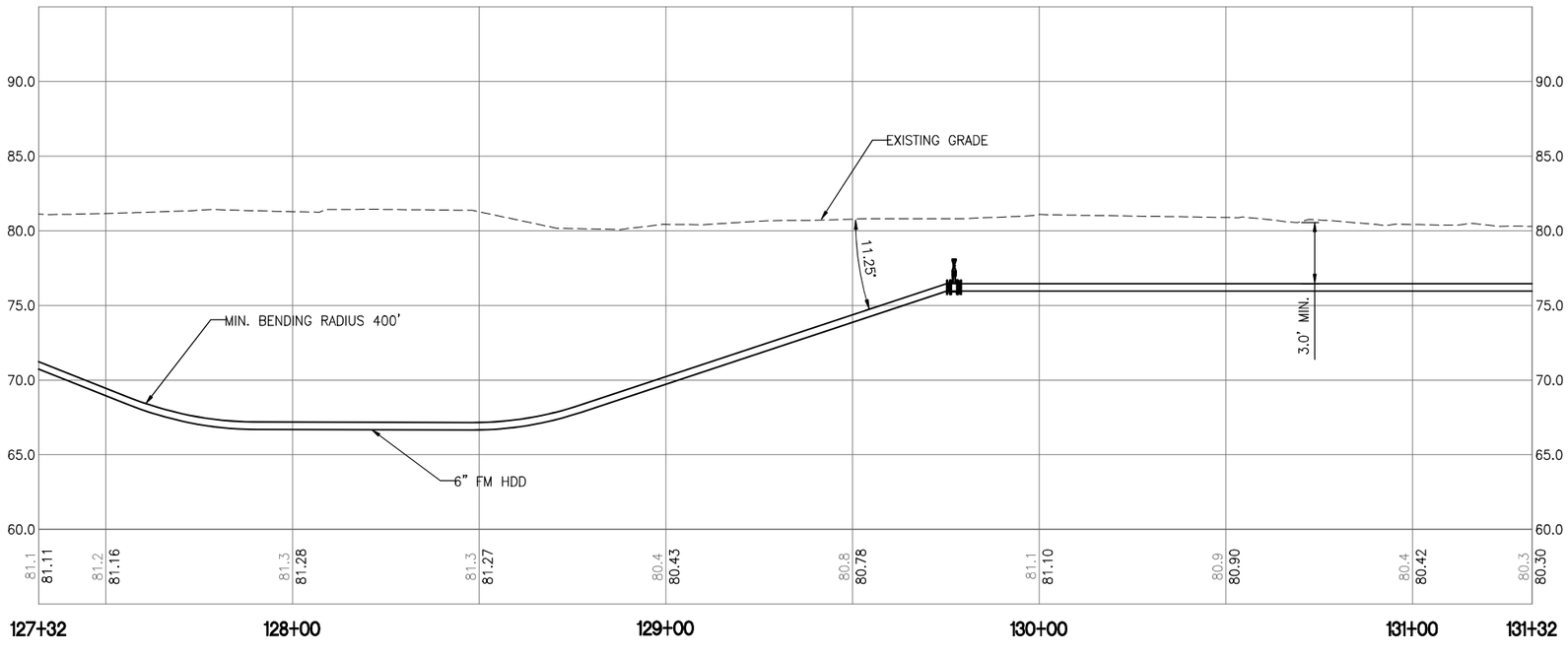
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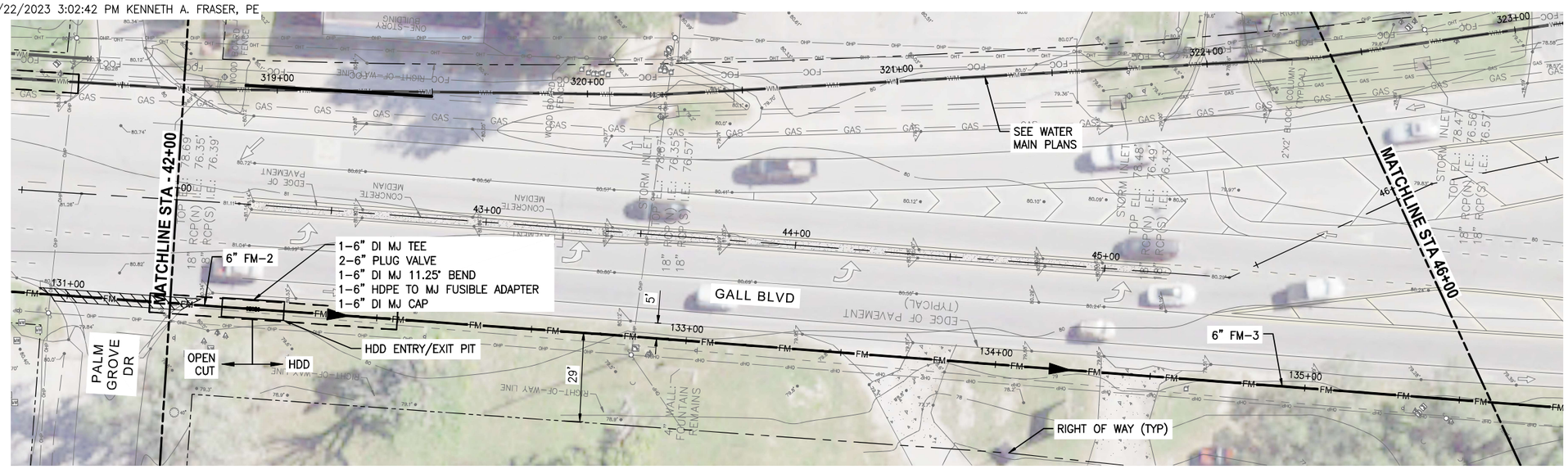
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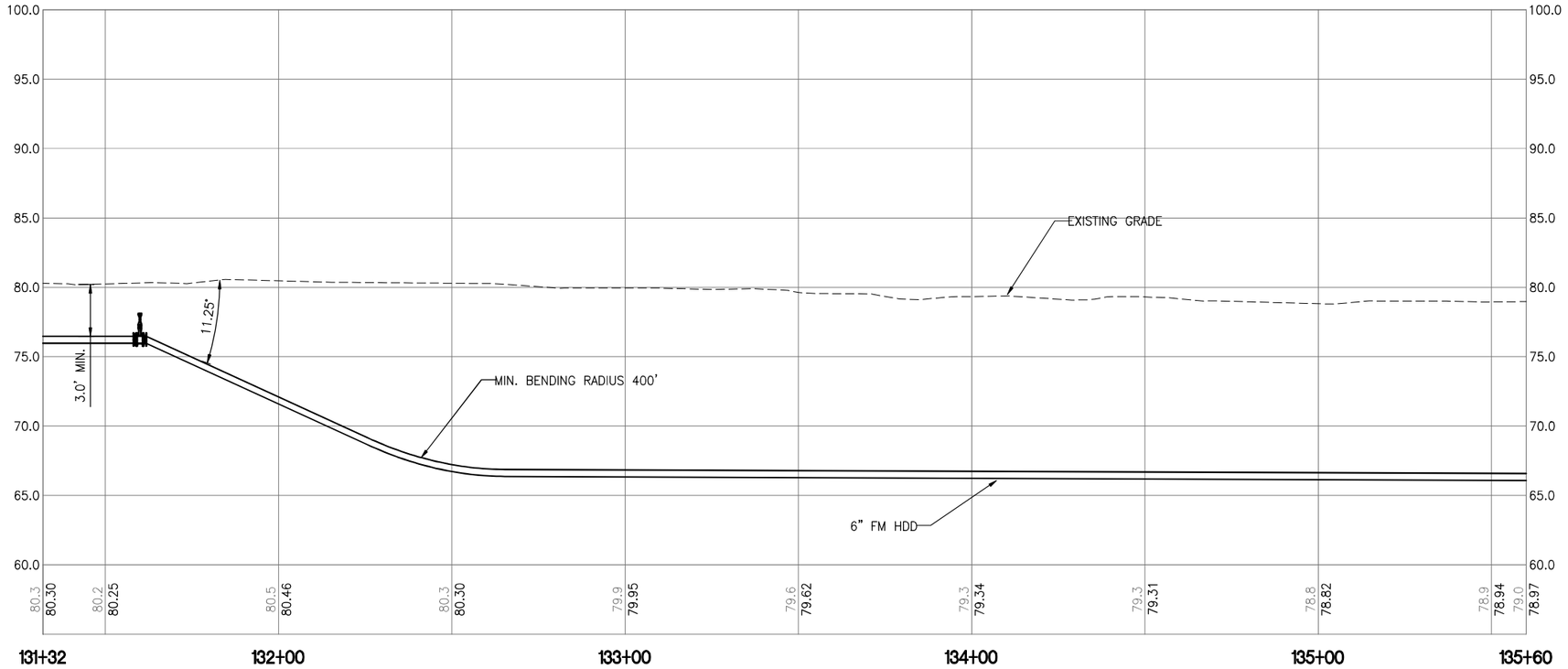
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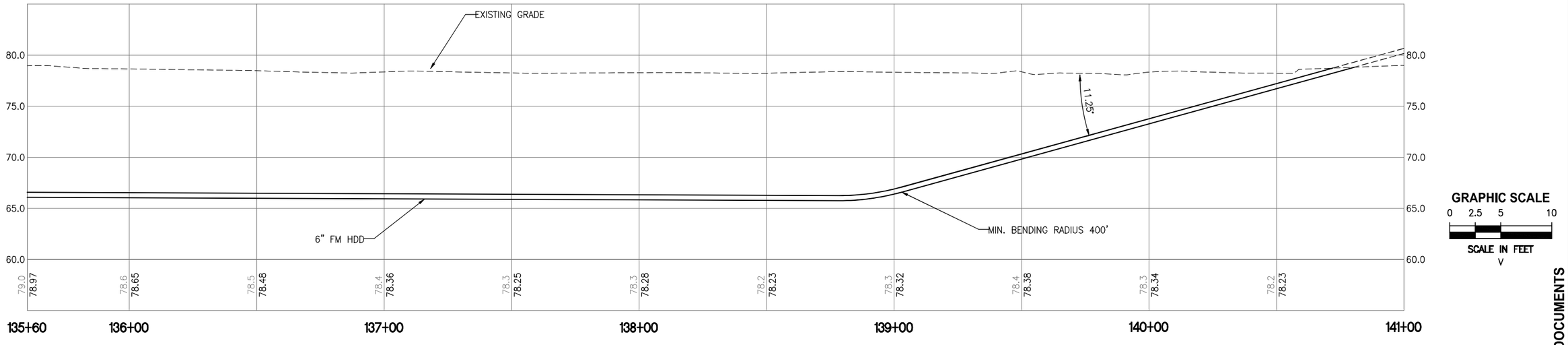
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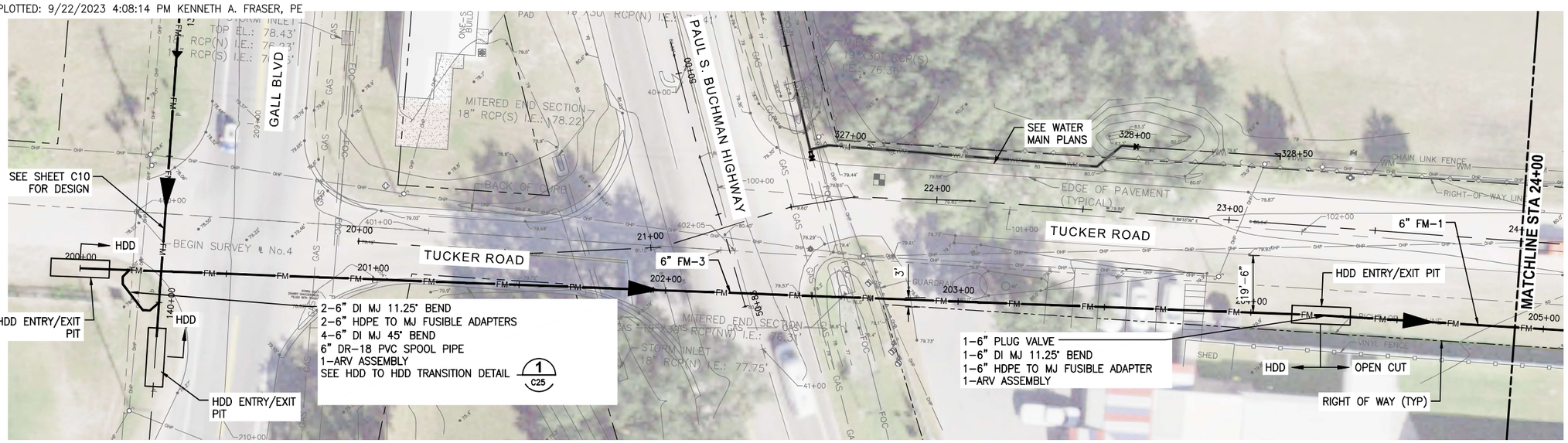
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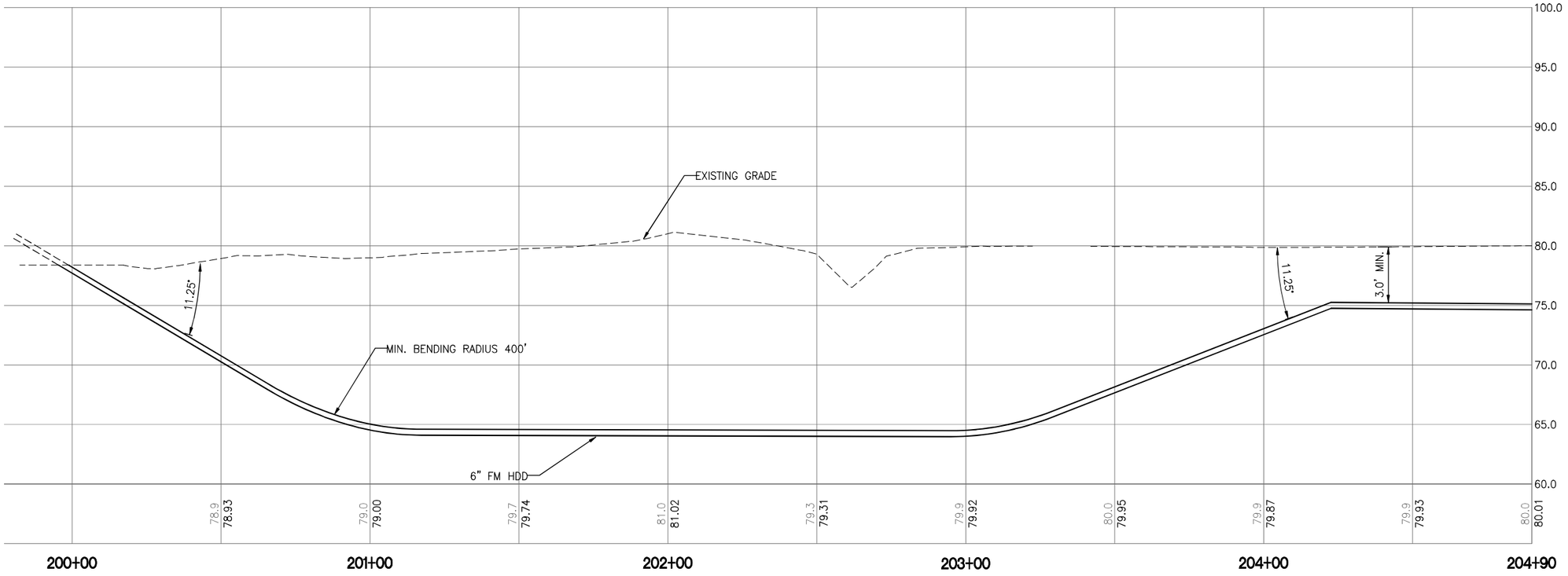
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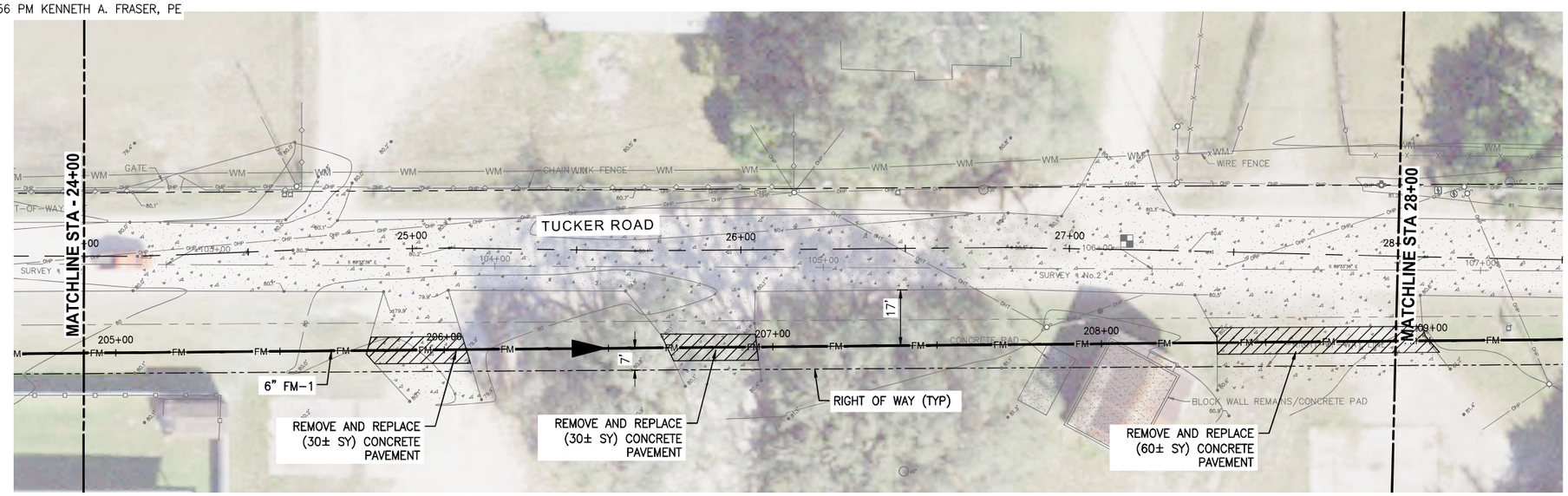
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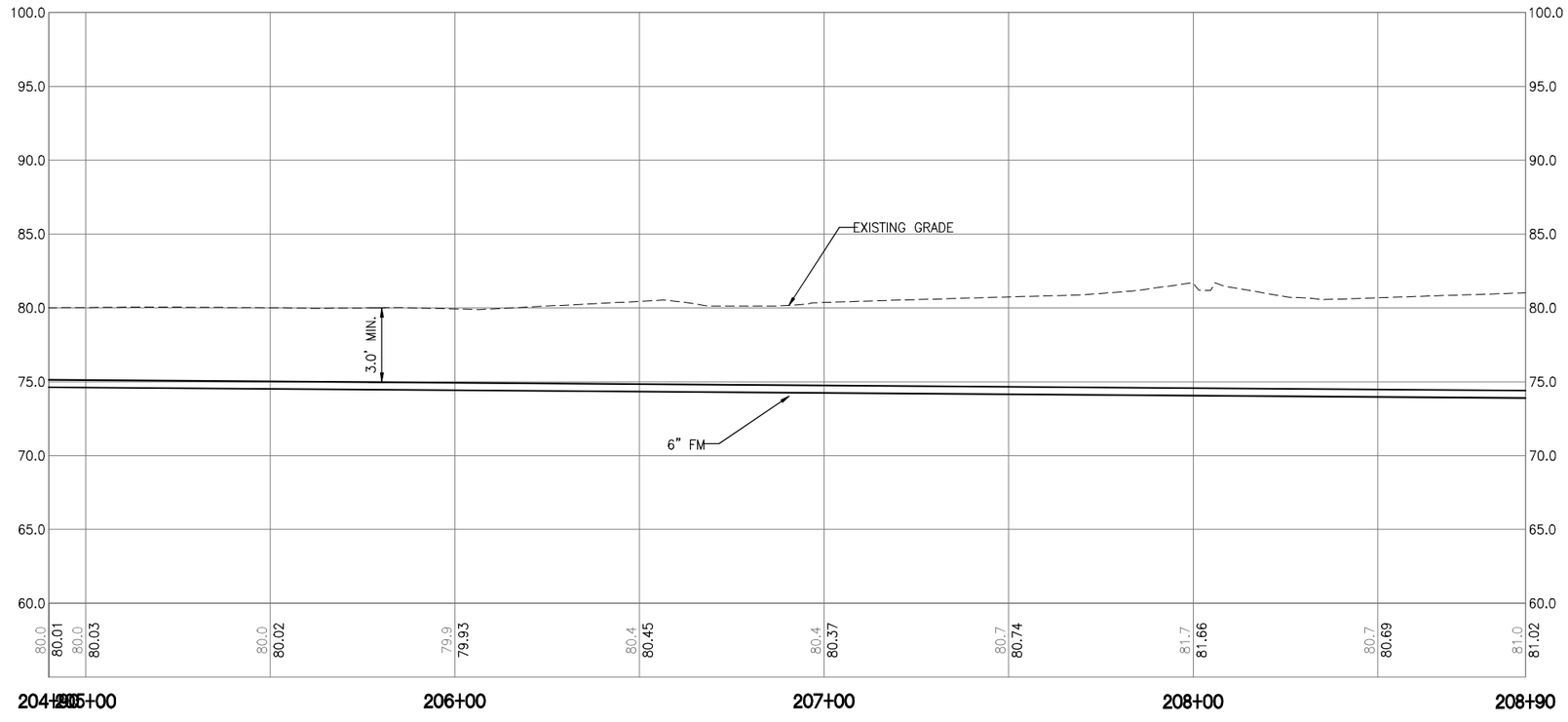
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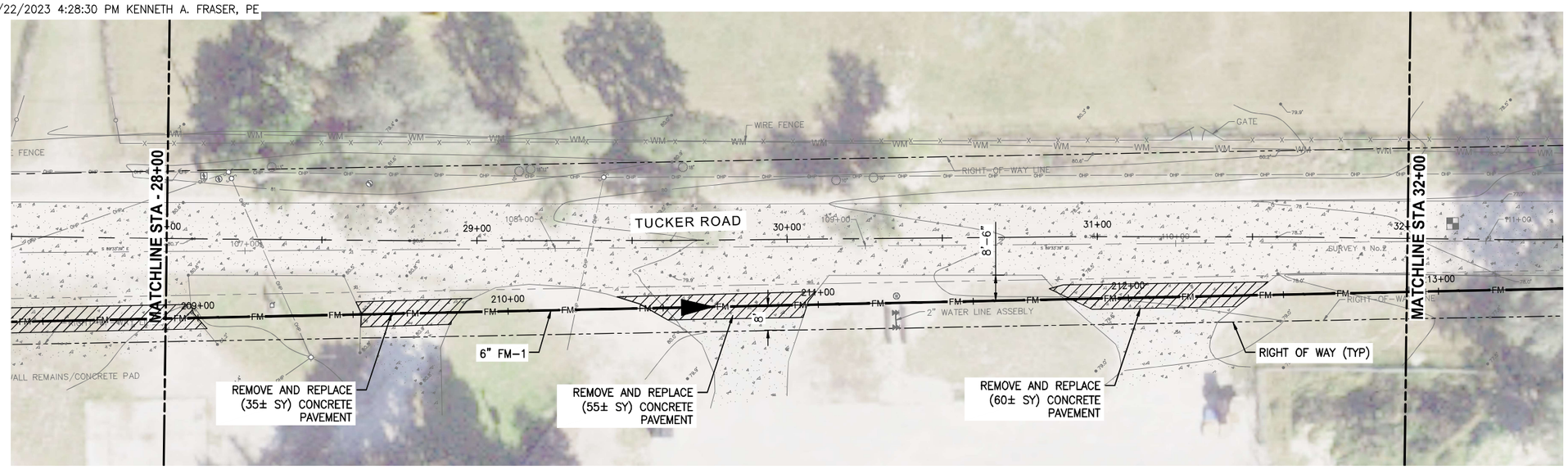
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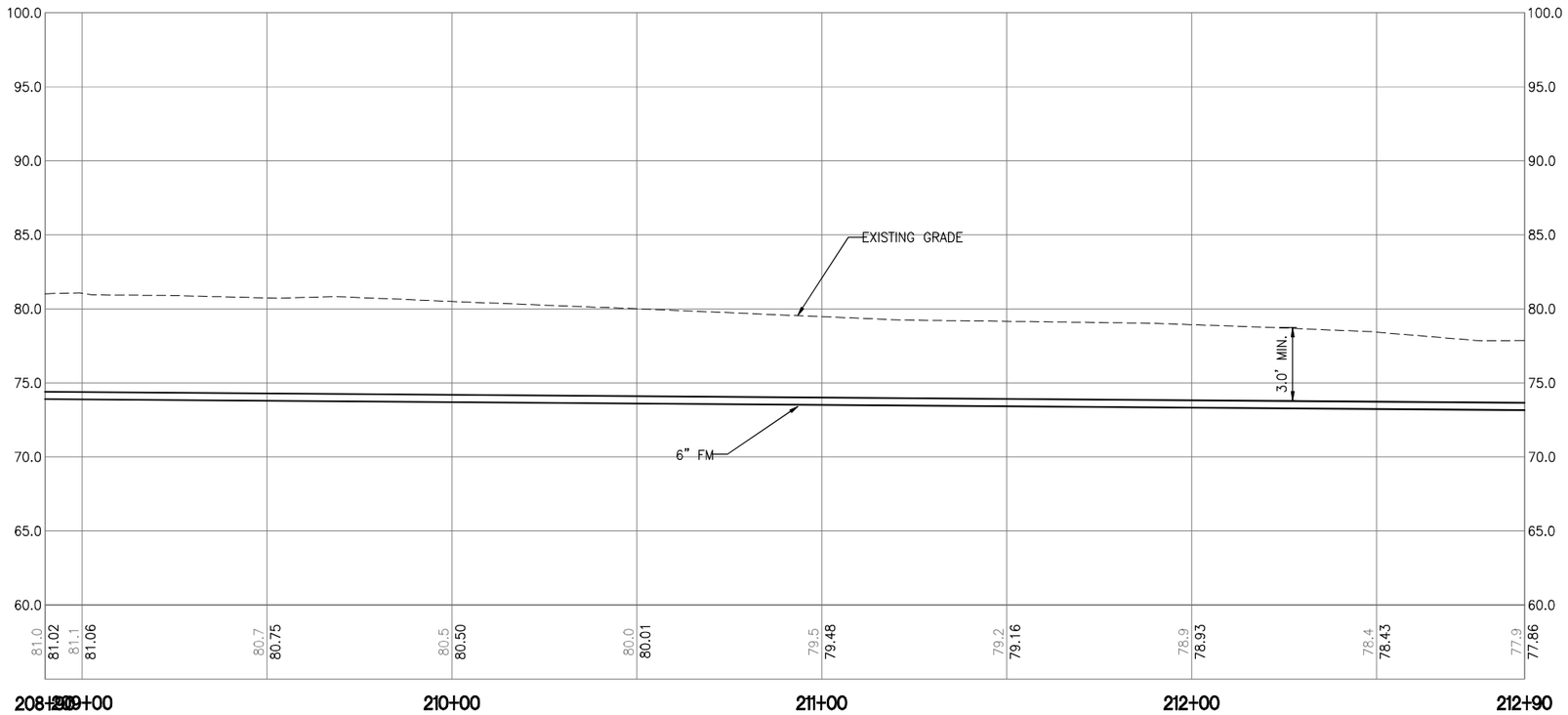
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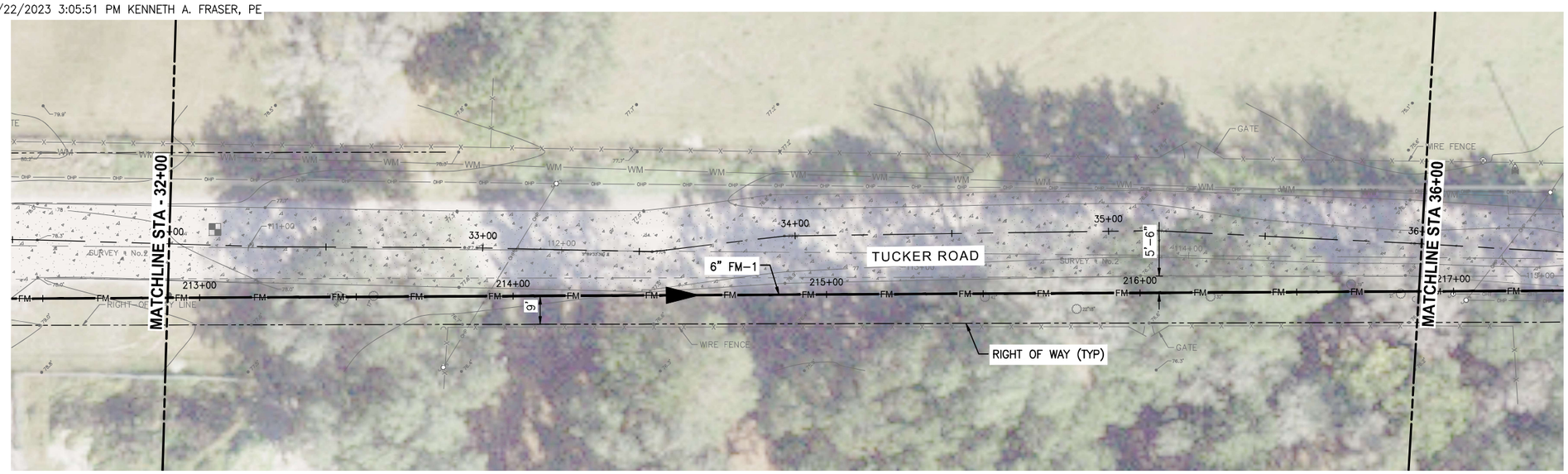
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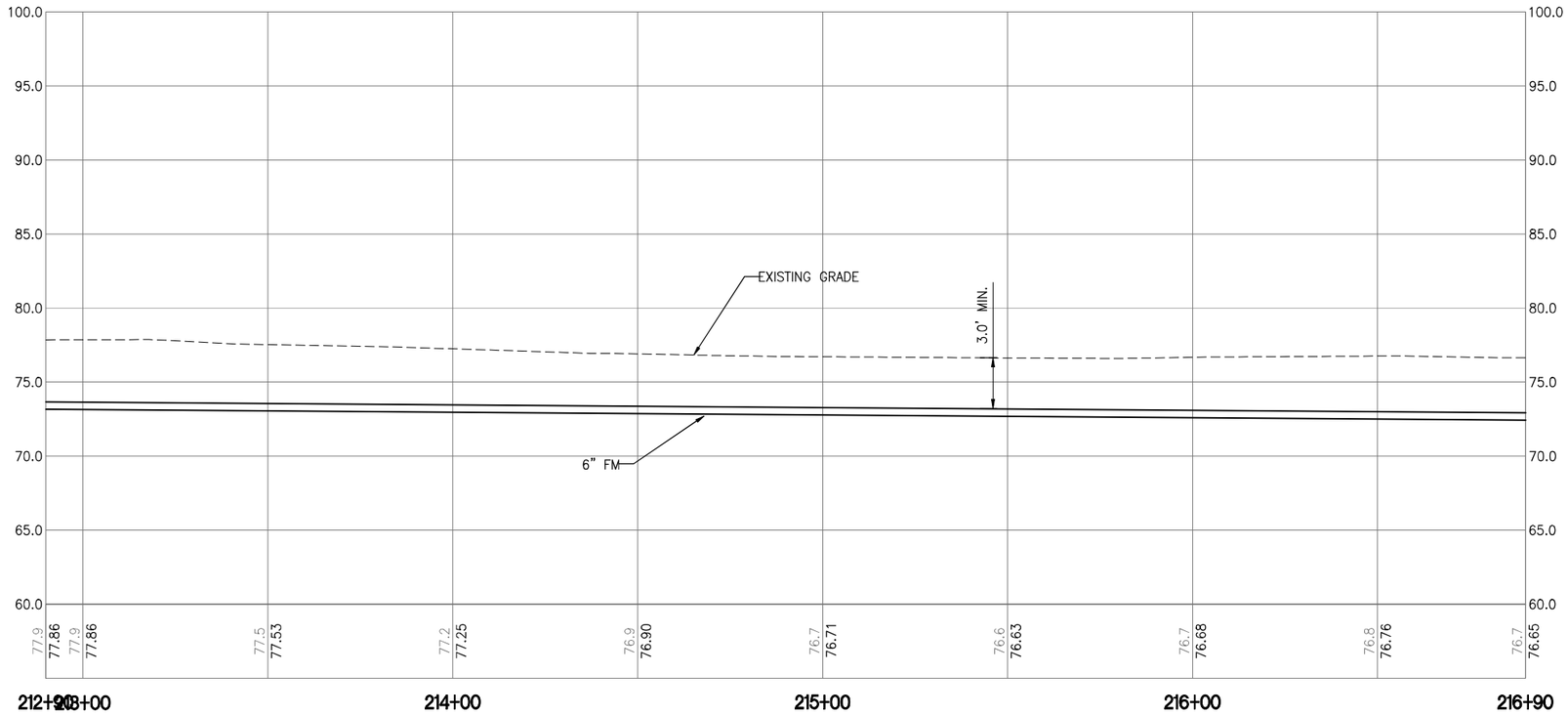
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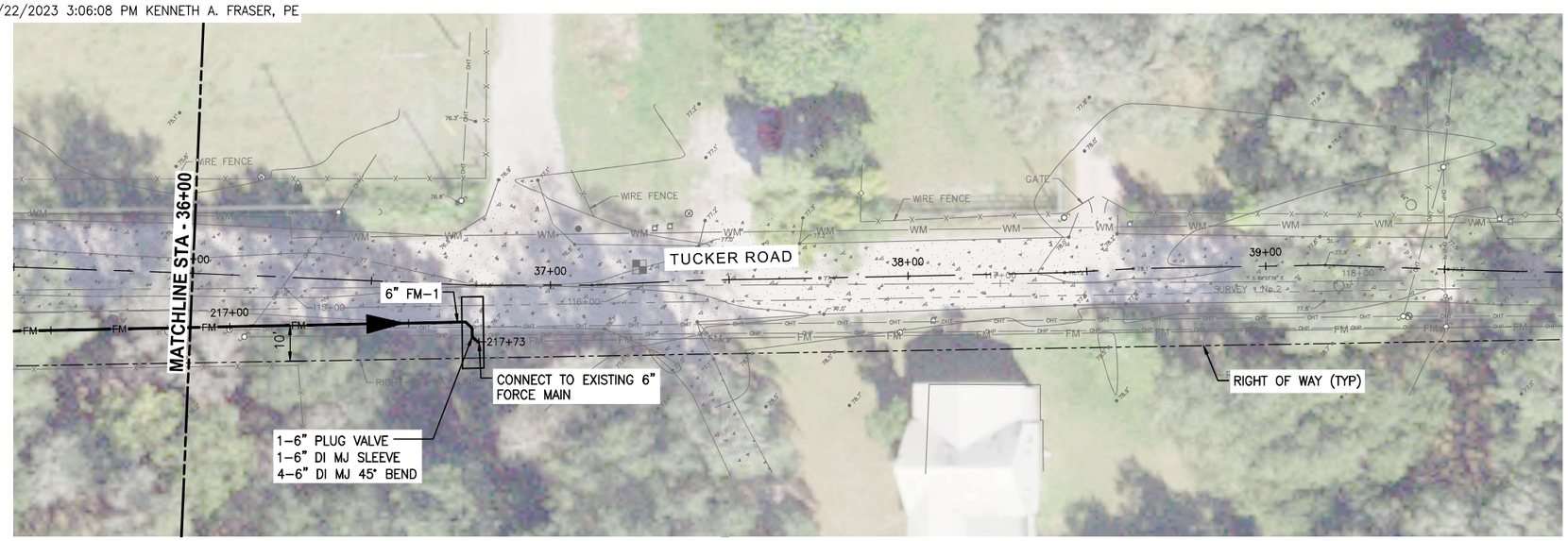
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INDEX NO:	DWG NO: C14

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James A. Meyer
11/6/2023

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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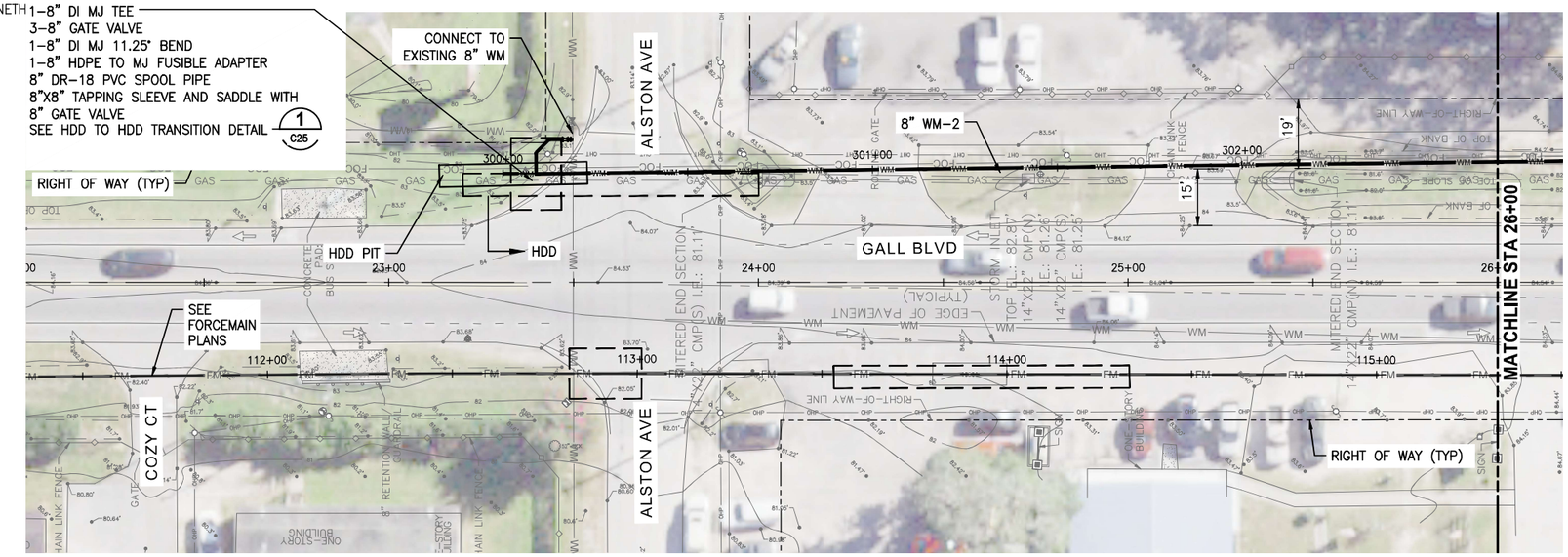
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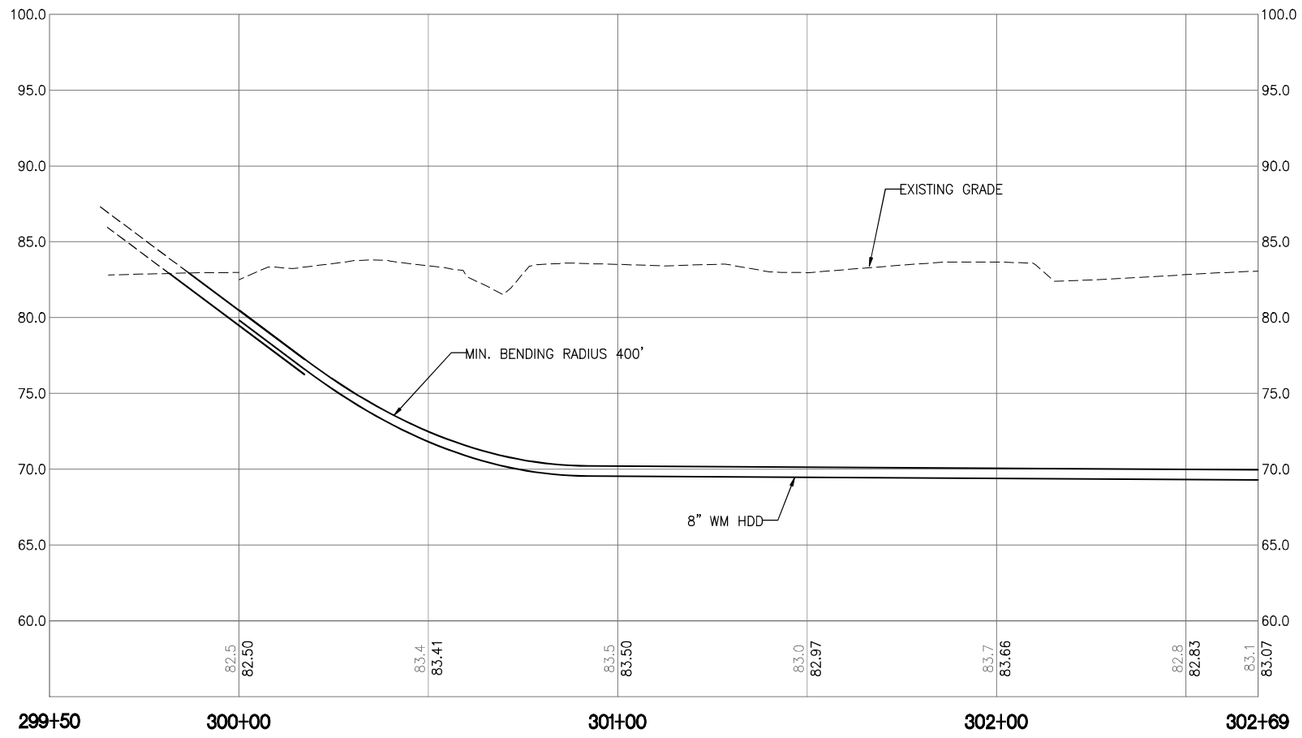
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1–8" DI MJ TEE
3–8" GATE VALVE
1–8" DI MJ 11.25° BEND
1–8" HDPE TO MJ FUSIBLE ADAPTER
8" DR–18 PVC SPOOL PIPE
8"X8" TAPPING SLEEVE AND SADDLE WITH 8" GATE VALVE
SEE HDD TO HDD TRANSITION DETAIL (1 / C25)



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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

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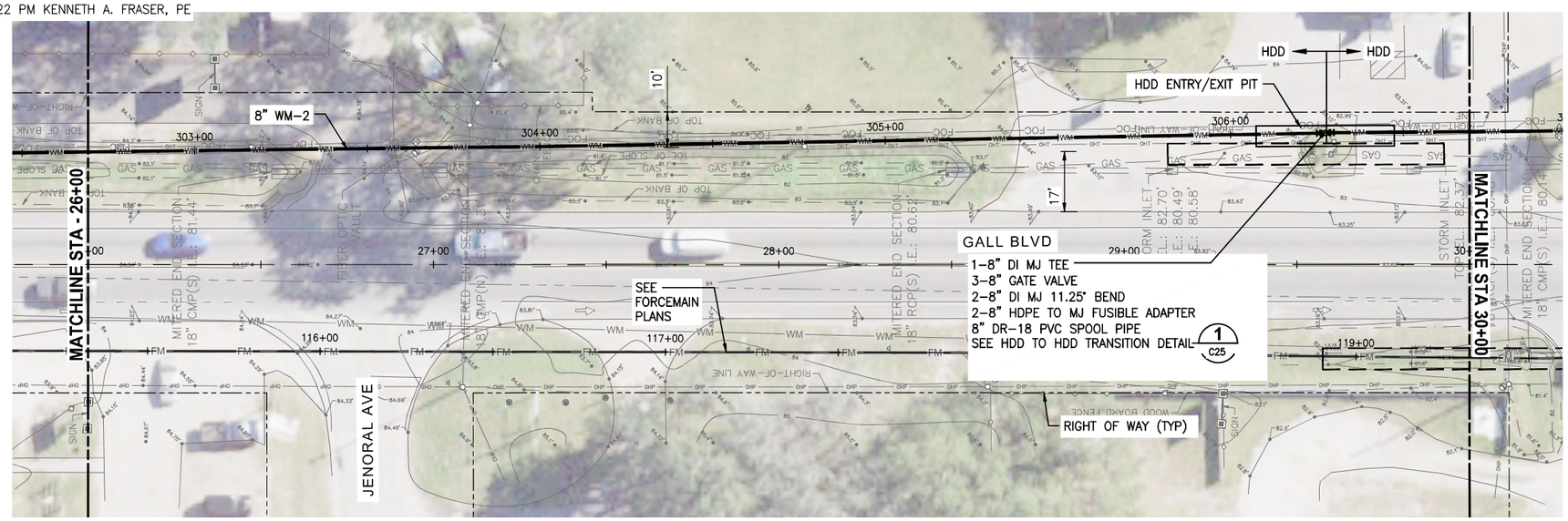
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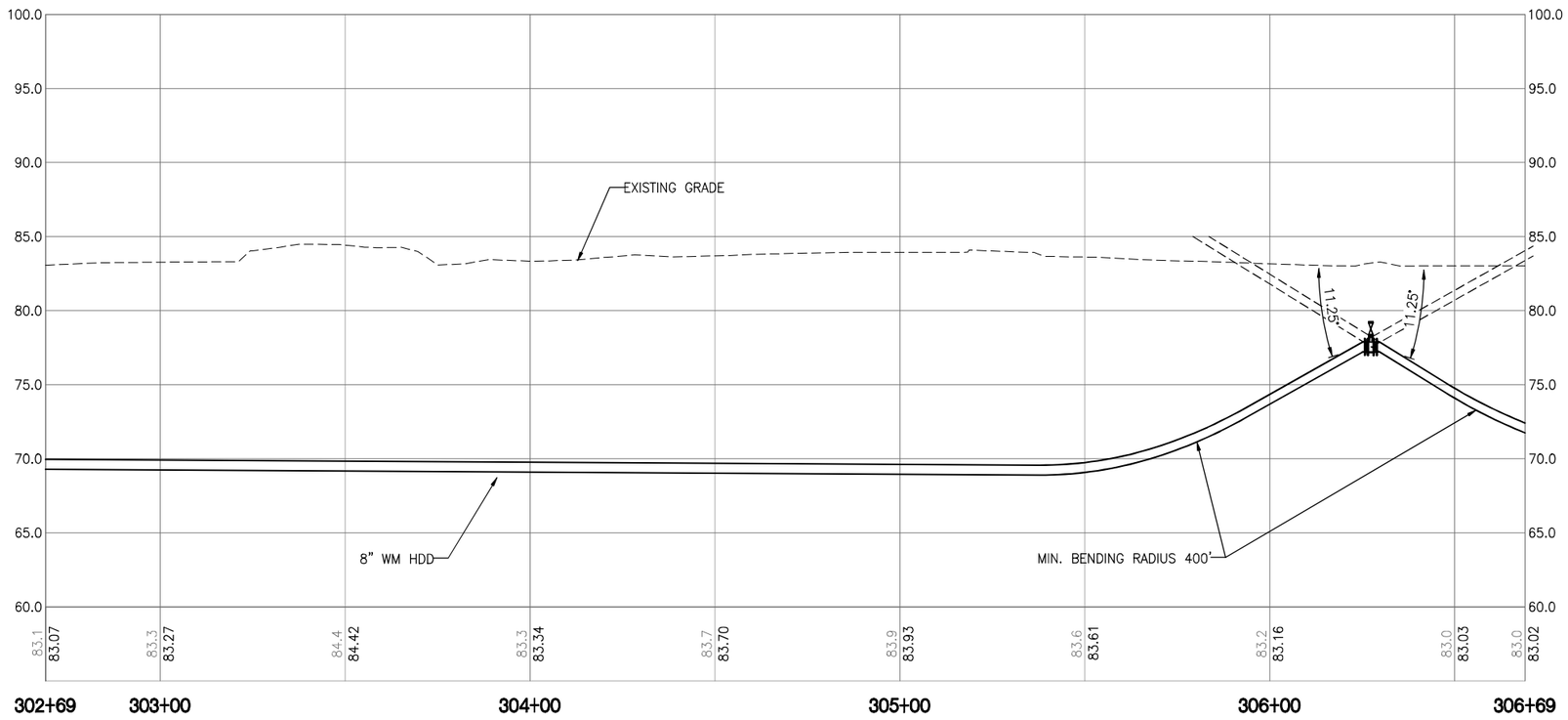
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

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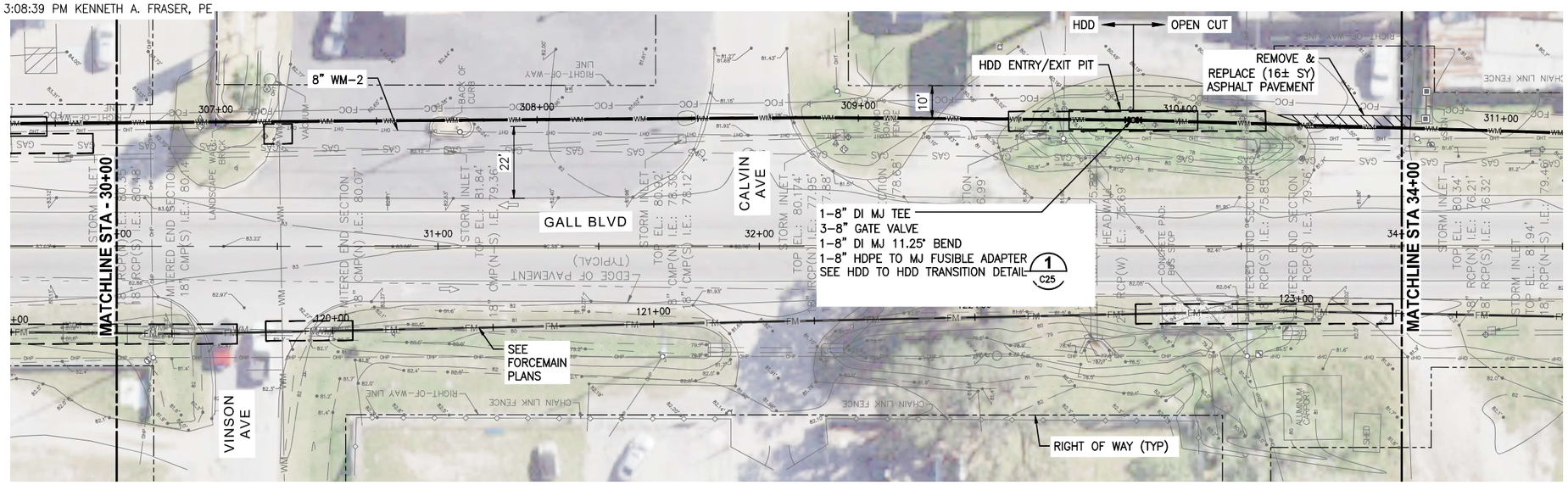
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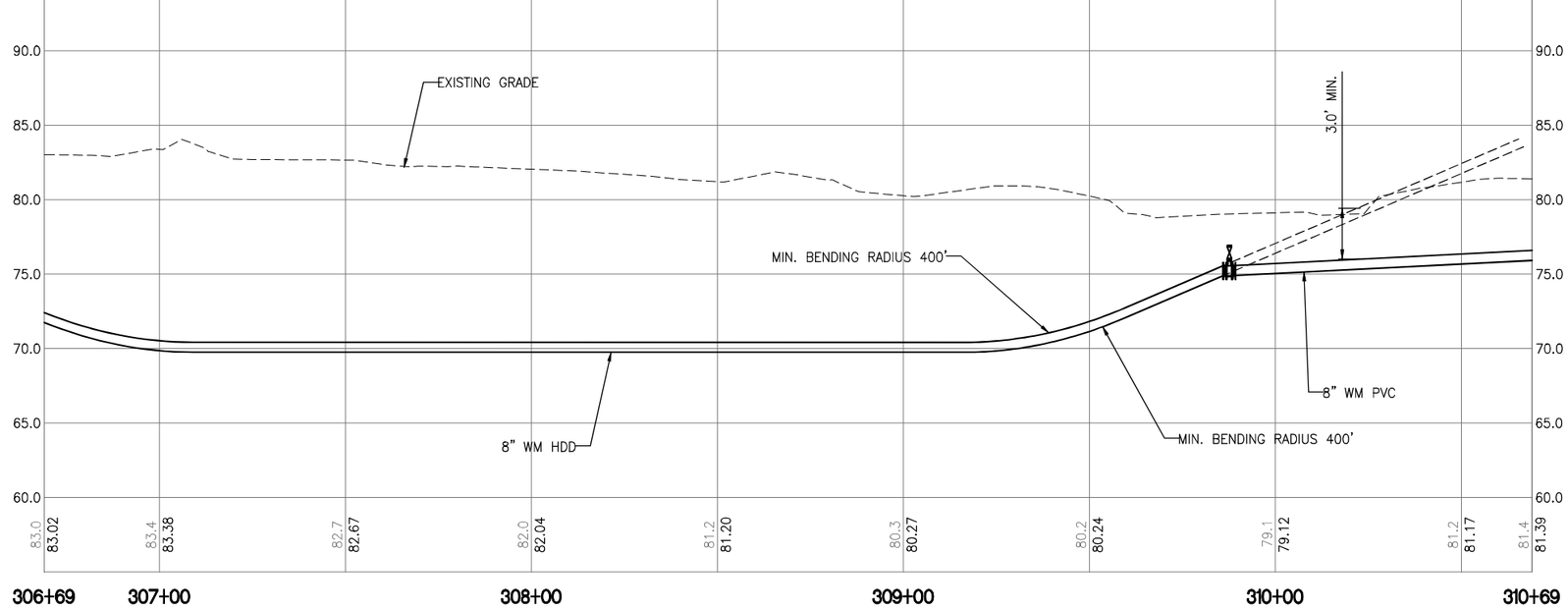
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

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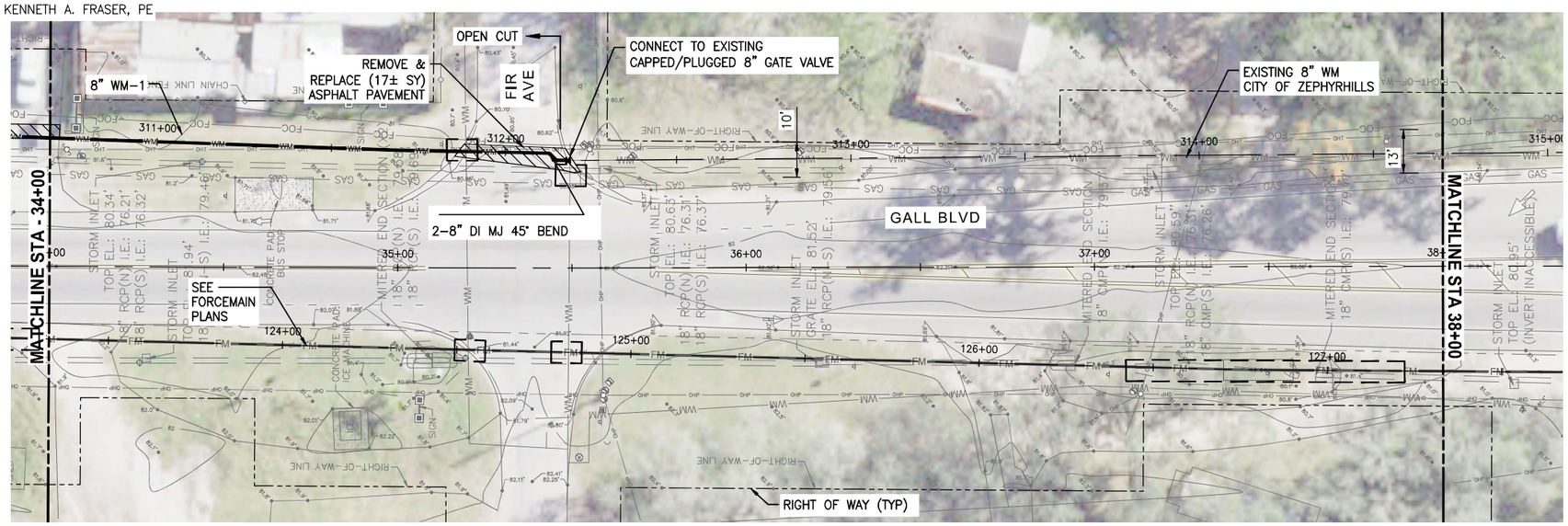
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DATE: SEPT 2023
INDEX NO:
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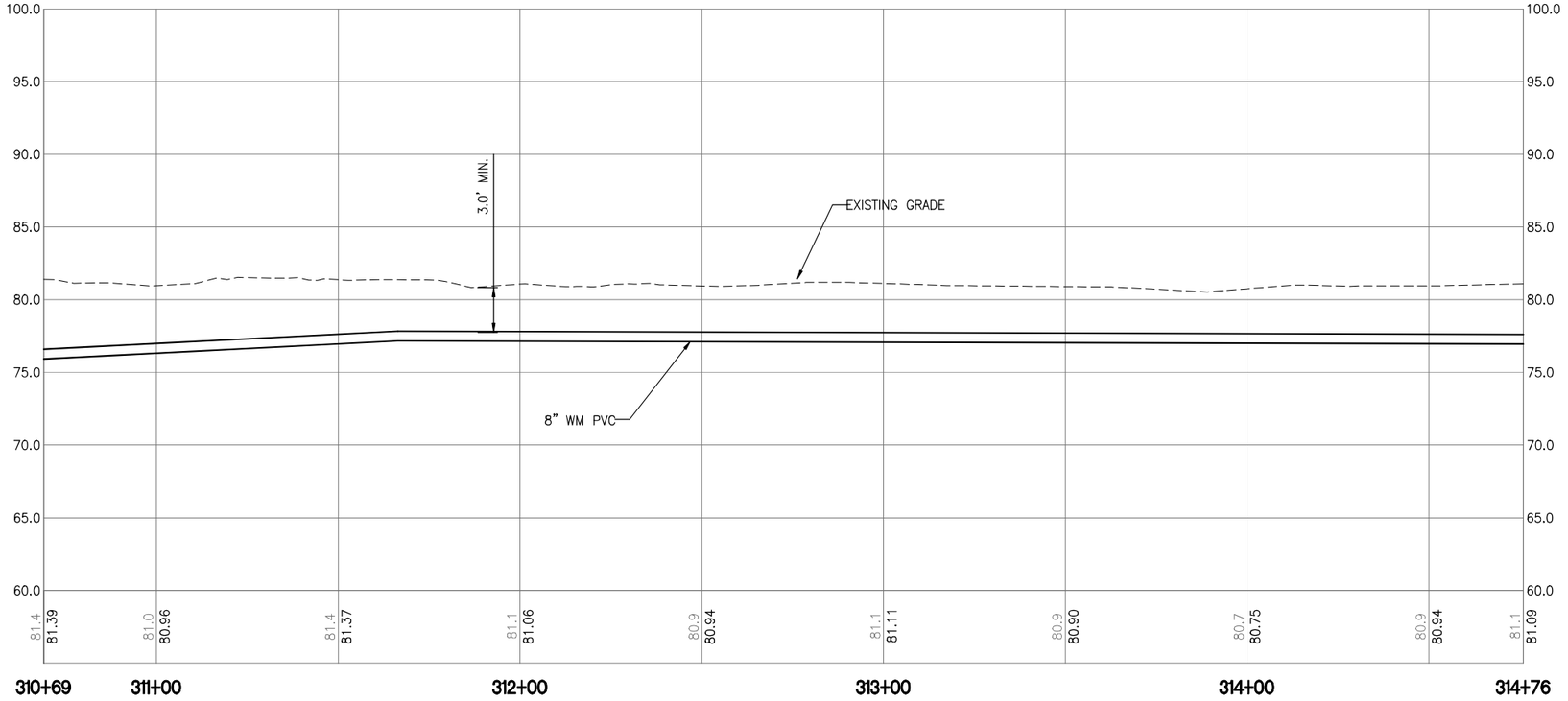
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

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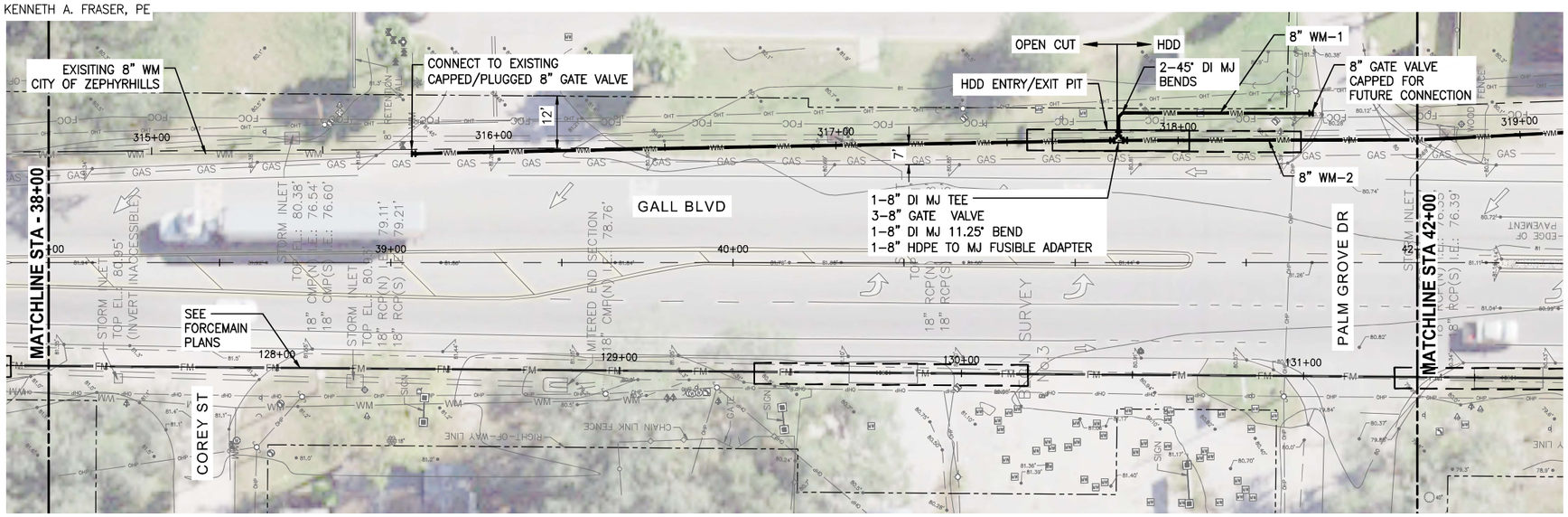
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INDEX NO:
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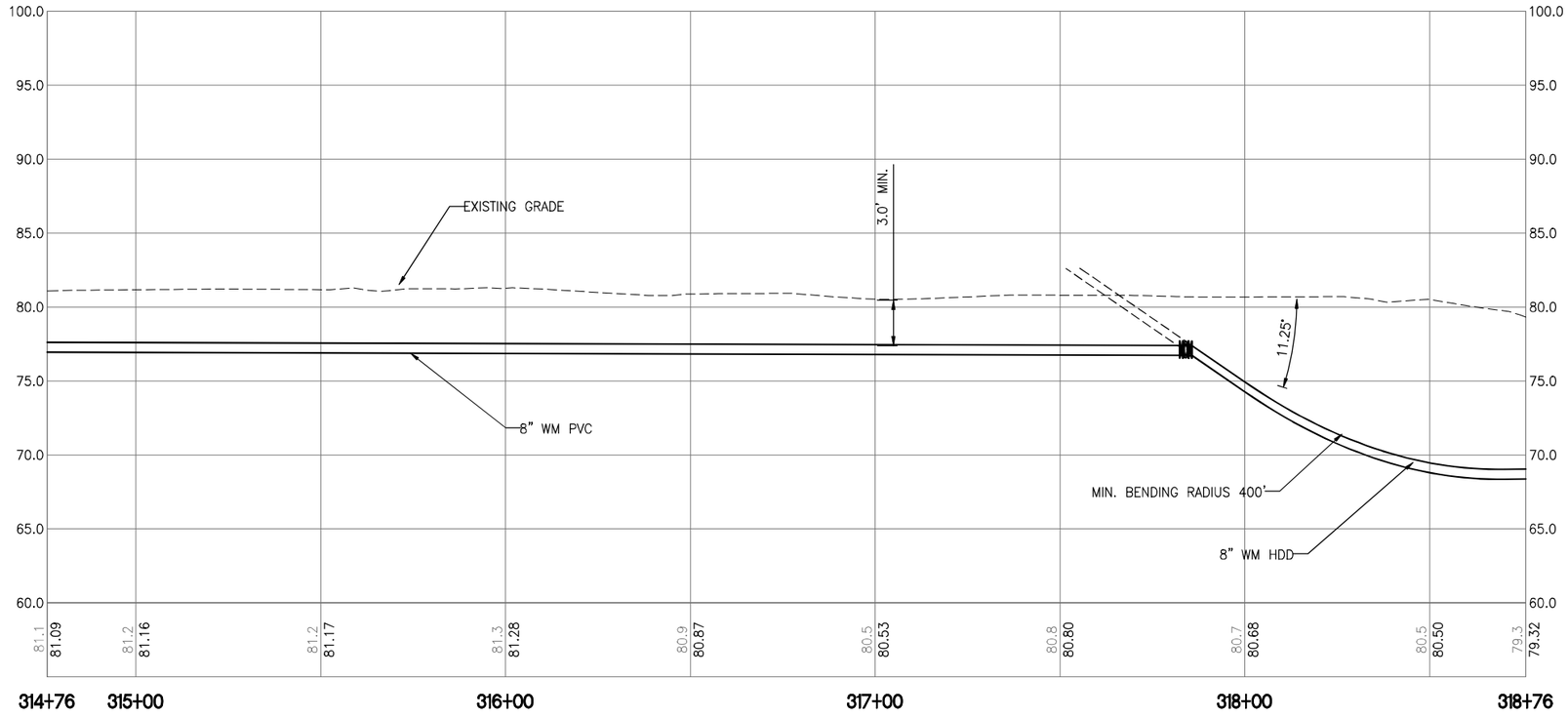
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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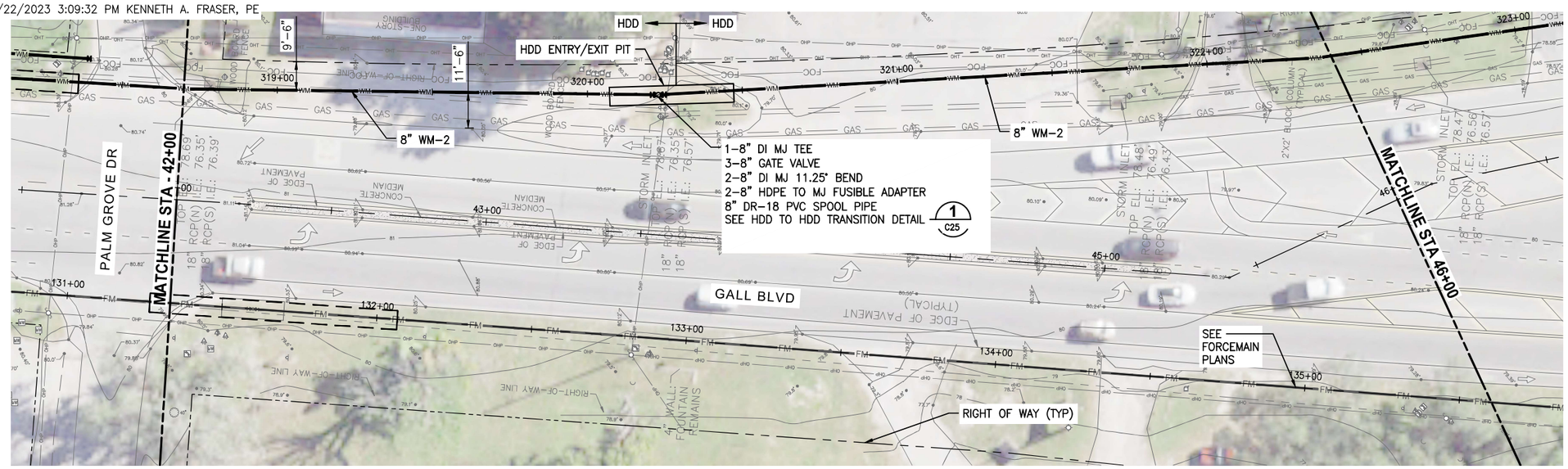
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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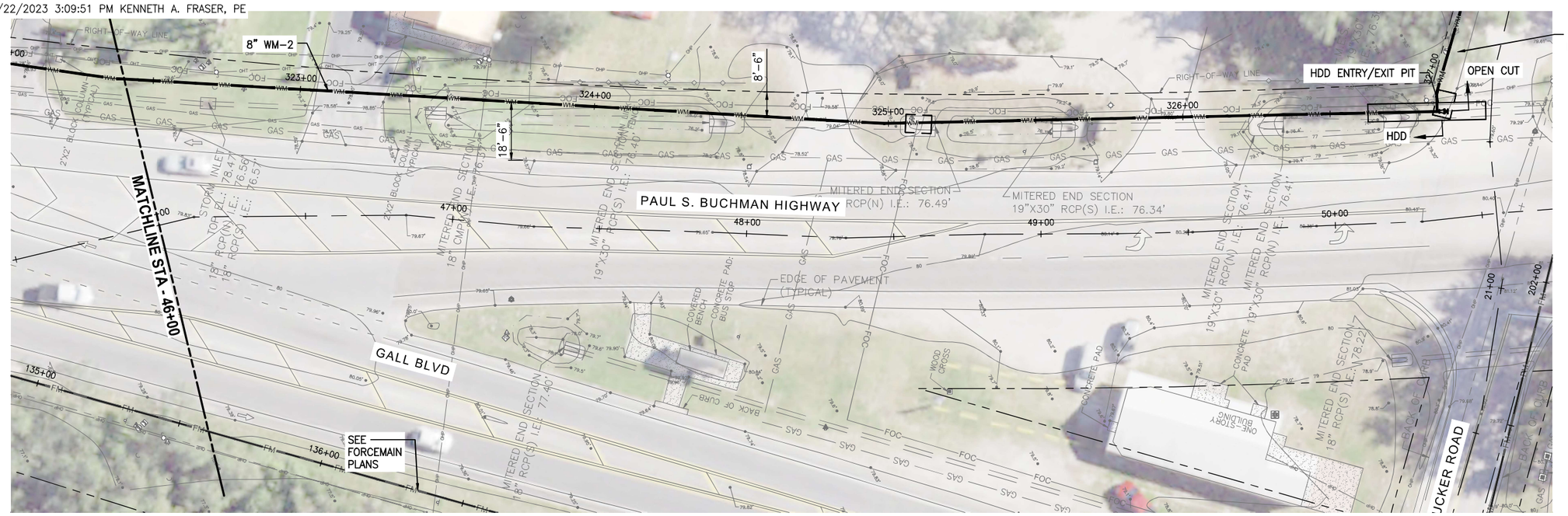
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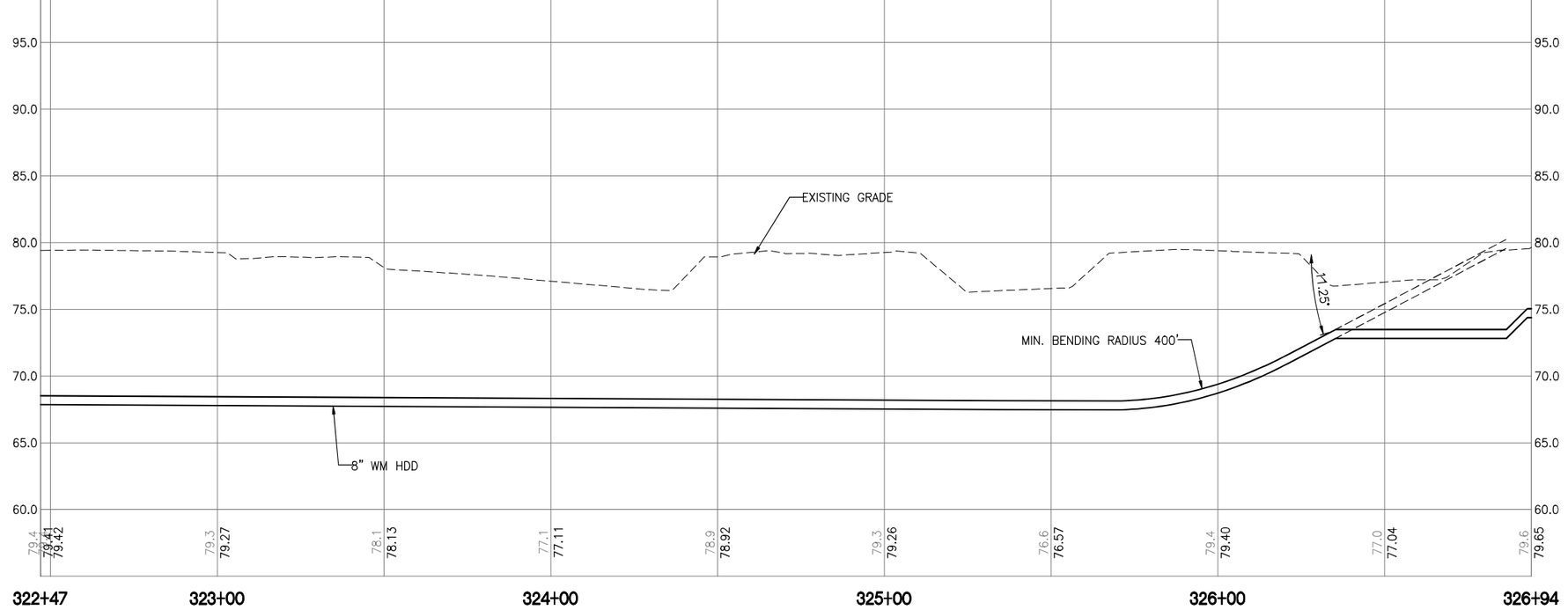
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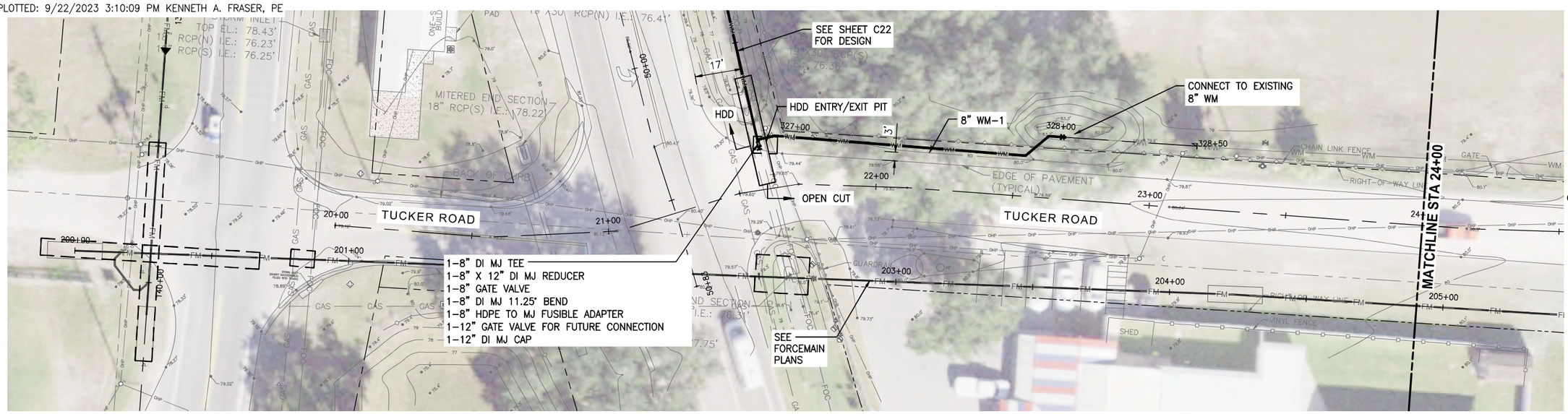
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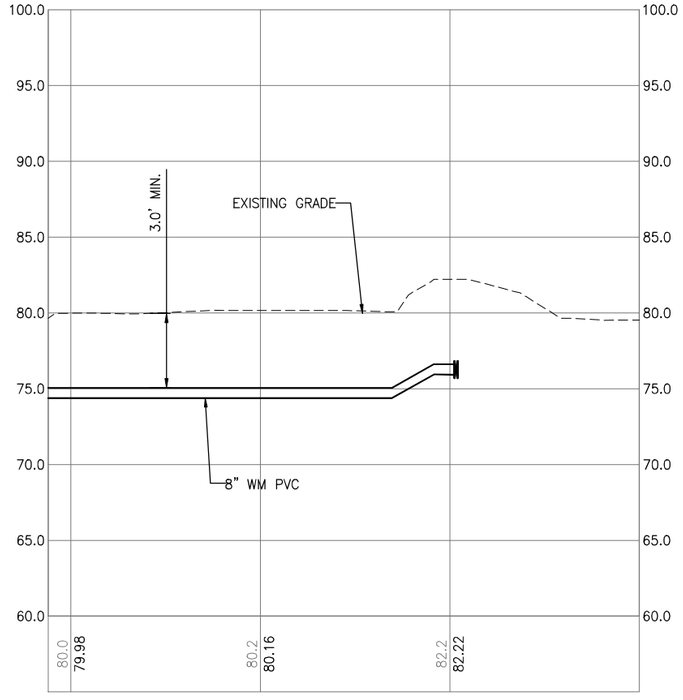
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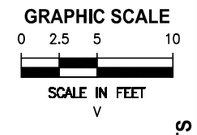
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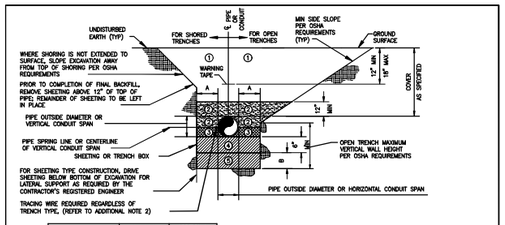
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NOMINAL PIPE DIAMETER OR HORIZONTAL CONDUIT SPAN (INCHES)	MINIMUM SIDEWALL CLEARANCE A (INCHES)	ADDITIONAL EXCAVATION DEPTH (1) B (INCHES)
LESS THAN 24	12	12
24 AND GREATER	18	18

(1) REQUIRED WHERE UNSUITABLE MATERIAL IS ENCOUNTERED.

ZONE NO.	ZONE NAME	MATERIAL	COMPACTION
①	FINAL BACKFILL	AS SPECIFIED	AT LEAST 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY ASTM D-1557 (WHEN UNDER PAVEMENT)
②	INITIAL BACKFILL		
③	HAUNCHING		
④	BEDDING		
⑤	FOUNDATION		

TRENCH ZONE NOTES:

① FINAL BACKFILL SHALL BE INSTALLED IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. REFER TO ADDITIONAL NOTE 3.

② INITIAL BACKFILL SHALL BE INSTALLED IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HAND TAMPING OR AN APPROVED METHOD OF MECHANICAL TAMPING. REFER TO ADDITIONAL NOTE 3.

③ HAUNCHING SHALL BE IN COMPLETELY DEWATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HAND TAMPING. HAUNCHING SHALL BE BROUGHT UP EQUALLY ON BOTH SIDES OF THE PIPE.

④ BEDDING SHALL BE INSTALLED IN COMPLETELY DEWATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT, AND SHALL BE COMPACTED BY HAND OR MECHANICAL TAMPING. PROPERLY SHAPED BELL HOLES SHALL BE EXCAVATED IN THE BEDDING TO PERMIT ASSEMBLY OF THE PIPE. REFER TO ADDITIONAL NOTE 3.

⑤ NATIVE, UNDISTURBED MATERIAL IN COMPLETELY DEWATERED TRENCHES MEETING THE COMPACTION AND MATERIAL REQUIREMENTS FOR COMPACTED BEDDING MATERIAL NEED NOT BE REPLACED OR REWORKED, EXCEPT FOR SHAPING OF THE BELL HOLES, AND WHERE REFILL IS REQUIRED.

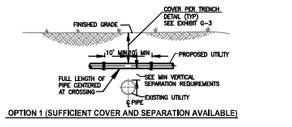
FOUNDATION SHALL BE REQUIRED WHERE UNSUITABLE MATERIAL IS ENCOUNTERED. FOUNDATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS FOR BEDDING. REFER TO ADDITIONAL NOTE 3.

ADDITIONAL NOTES:

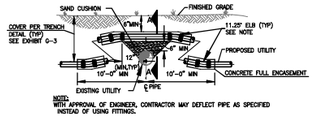
1. FOR TRENCHES IN VEHICULAR TRAFFIC AREAS OR BENEATH SURFACE IMPROVEMENTS (CG, SLABS, ASPHALT, ETC.) SEE CONTRACT SPECIFICATIONS FOR ADDITIONAL COMPACTION REQUIREMENTS. SEE DRAWINGS FOR SURFACE IMPROVEMENT AND /OR RESTORATION DETAILS WHERE APPLICABLE.
2. TRACING WIRE SHALL BE INSTALLED ON THE SIDE OF THE PIPE AND ATTACHED TO THE PIPE EVERY 10' W/ A NYLON WIRE TIE. IF THE WIRE IS DAMAGED OR NEEDS TO BE EXTENDED A 3M WATERPROOF TYPE UF SPLICE SHALL BE INSTALLED TO REPAIR THE WIRE. THE ENDS OF THE TRACING WIRE SHALL BE BROUGHT UP IN EVERY VALVE BOX ON THE LINE AND AT THE HYDRANT VALVES. THERE SHALL BE A MINIMUM COIL OF 3' LEFT UNDER THE VALVE BOX COVER. THE WIRE SHALL BE TESTED TO VERIFY CONDUCTIVITY.
3. ALTERNATIVE LIFT THICKNESSES, NOT EXCEEDING 12 INCHES LOOSE MEASUREMENT, ARE ACCEPTABLE IN TRENCH ZONES 1, 2, 4, AND 5 PROVIDED 1) THE LIFT THICKNESS DOES NOT EXCEED THE MAXIMUM VALUE RECOMMENDED IN WRITING BY THE APPLICABLE PIPE MANUFACTURER AND 2) FIELD TEST RESULTS CONFIRM THAT THE SPECIFIED COMPACTION REQUIREMENTS ARE BEING MET.

TYPICAL UTILITY TRENCH DETAIL
NTS

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613
DECEMBER 2015
G-3



OPTION 1 (SUFFICIENT COVER AND SEPARATION AVAILABLE)



NOTE:
WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

ALTERNATE OPTION 1 (SUFFICIENT COVER OR SEPARATION NOT AVAILABLE)

PROPOSED UTILITY	MINIMUM VERTICAL SEPARATION REQUIREMENTS						
	POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS	COMMENTS
POTABLE WATER	1'-0"	1'-0"(1,2)	1'-0"(1,2)	1'-0"(1)	1'-0"	1'-0"	SEE NOTE 1
GRAVITY SANITARY SEWER	1'-6"(2)	1'-0"	1'-0"	1'-0"	1'-0"(2)	1'-0"	SEE NOTE 2
SEWAGE FORCE MAIN	1'-6"(2)	1'-0"	1'-0"	1'-0"	1'-6"(2)	1'-0"	
STORM	1'-0"(1)	1'-6"	1'-0"	1'-0"	1'-0"	1'-0"	SEE NOTE 2
RECLAIMED WATER	1'-0"	1'-6"	1'-0"	1'-0"	1'-0"	1'-0"	
ELECTRIC TELECOMMUNICATIONS	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	

(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

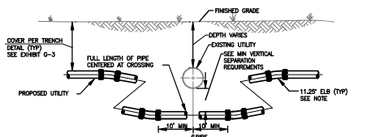
NOTES:
1. ONLY OPTION 1 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.
2. ONLY OPTION 2 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.

MINIMUM VERTICAL SEPARATION REQUIREMENTS

PROPOSED UTILITY	MINIMUM HORIZONTAL SEPARATION EXISTING UTILITY					
	POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS
POTABLE WATER	1'-0"	10'-0"(1,2)	10'-0"(1,2)	3'-0"(1)	3'-0"(1)	3'-0"
GRAVITY SANITARY SEWER	10'-0"(2)	1'-0"	1'-0"	3'-0"	3'-0"(2)	3'-0"
SEWAGE FORCE MAIN	10'-0"(2)	1'-0"	1'-0"	3'-0"	3'-0"(2)	3'-0"
STORM	3'-0"(1)	3'-0"	3'-0"	1'-0"	3'-0"	3'-0"
RECLAIMED WATER	3'-0"(1,3)	3'-0"(2)	3'-0"(2)	3'-0"	1'-0"	3'-0"
ELECTRIC TELECOMMUNICATIONS	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	2'-0"

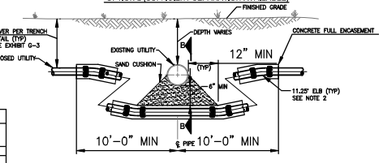
(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

NOTE:
UTILITIES SHALL NOT BE INSTALLED WITHIN THE DRIP LINE OF TREES WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.



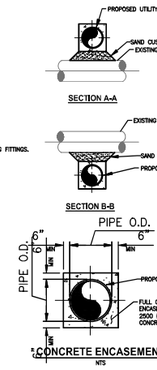
NOTE:
WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

OPTION 2 (SUFFICIENT SEPARATION AVAILABLE)



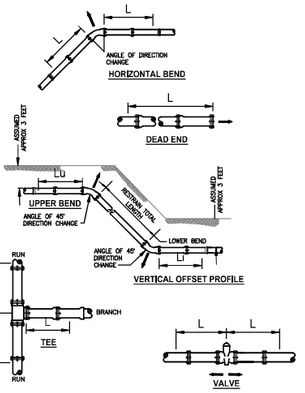
NOTES:
1. FOR PROPOSED WATER MAINS, THIS OPTION IS ONLY ALLOWED WITH APPROVAL OF THE ENGINEER AND FDEP ON A CASE BY CASE BASIS.
2. WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

ALTERNATE OPTION 2 (SUFFICIENT SEPARATION NOT AVAILABLE)



UTILITY CONFLICT

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613
DECEMBER 2015
G-4

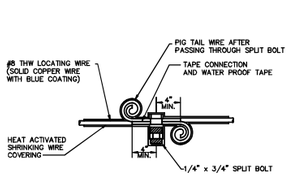


NOMINAL SIZE	VALVES OR DEAD-ENDS	HORIZONTAL BENDS 90° BENDS	45° BENDS	22.5° BENDS	11.25° BENDS	VERTICAL OFFSET Lu	Ll	TEES RUN SIZE	BRANCH SIZE	L (FT)	REDUCERS RUN SIZE	L (FT)
10	84	37	16	85	4	35	16	10	≤10	27	12 TO 10	29
12	99	43	18	9	5	41	18	12	≤12	41		

NOTES:
1. THE SCHEDULE SHOWN IS FOR THE FOLLOWING SERVICE CONDITIONS: 150 PSIG; SPECIFIED TRENCH ZONE MATERIAL; 36 INCHES COVER; TYPE 3 LAYING CONDITIONS; AND 1.5 SAFETY FACTOR.
2. RESTRAINED LENGTHS SHOWN IN TABLE ARE IN FEET AND ARE MINIMUM LENGTHS REQUIRED IN EACH DIRECTION FROM FITTING OR VALVES.
3. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING RESTRAINED JOINTS.
4. ALL PIPE SHALL BE RESTRAINED TO THE NEXT JOINT BEYOND THE RESTRAINED LENGTH GIVEN.
5. EACH SIDE OF HDPE TRANSITION FITTINGS SHALL BE RESTRAINED PER THE RESTRAINED JOINT SCHEDULE AS AN IN-LINE VALVE.

TYPICAL RESTRAINED JOINT DETAIL
NTS

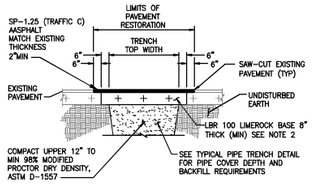
NOTE:
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NOTES:
1. THE ENDS OF ALL LOCATING WIRES, WHETHER THEY ARE SPLICED, CONNECTED, OR TERMINATED, SHALL HAVE THE LAST THREE INCHES PIG TAILED AS DETAILED HEREON.
2. AFTER INSTALLATION OF THE LOCATING WIRE THE SYSTEM SHALL BE SUBJECTED TO TESTING, IN THE PRESENCE OF CITY UTILITIES STAFF PRIOR TO BACKFILL, IN ORDER TO THAT THE SYSTEM IS FUNCTIONAL.

LOCATING WIRE SPLICING
NOT TO SCALE

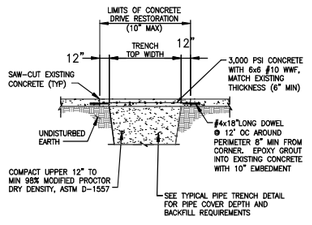
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CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613
DECEMBER 2015
G-8



NOTES:
1. ASPHALT PAVEMENT RESTORATION DETAIL APPLIES TO CITY ROADS, DRIVEWAYS, PRIVATE ROADS, DRIVES, MISCELLANEOUS PATCHES, AND SIMILAR RESTORATION.
2. NEW LIMEROCK TO BE COMPACTED TO NOT LESS THAN 98% MODIFIED PROCTOR DRY DENSITY, ASTMD-1557.
3. FOR COUNTY ROADS AND STATE ROADS, DESIGN SHALL BE IN COMPLIANCE WITH PASCO COUNTY STANDARDS AND FDOT STANDARDS RESPECTFULLY.

ASPHALT PAVEMENT RESTORATION
NTS

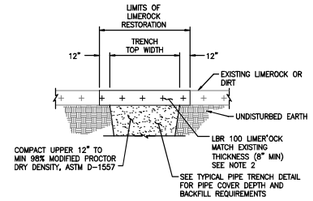
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DECEMBER 2015
G-9



NOTES:
MATCH EXISTING GRADE AND FINISH.

CONCRETE DRIVE RESTORATION
NTS

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PHONE (813)780-0029 FAX (813)780-0613
DECEMBER 2015
G-9A



NOTES:
1. LIMEROCK PAVEMENT RESTORATION DETAIL APPLIES TO COUNTY ROADS, DRIVEWAYS, PRIVATE ROADS, DRIVES, MISCELLANEOUS PATCHES, AND SIMILAR RESTORATION.
2. NEW LIMEROCK TO BE COMPACTED TO NOT LESS THAN 98% MODIFIED PROCTOR DRY DENSITY, ASTMD-1557.

LIMEROCK RESTORATION
NTS

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PHONE (813)780-0029 FAX (813)780-0613
DECEMBER 2015
G-9B

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

CIVIL DETAILS

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH A. FRASER, PE #57452 ON THE DATE SHOWN ON THE COVER SHEET.

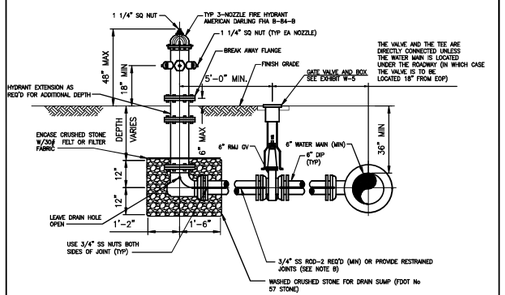
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PROJECT NO: 26110-051-01
DATE: SEPT 2023
INDEX NO:
DWG NO: C24

Approved 2023-H-03-00197 James A. Meyer 11/6/2023

SAVED: 9/22/2023 2:56 PM KFRASER Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\051-01 SOUTH 301 W-WW PIPELINES\DESIGN&CONSTRUCTION\CAD\DWGS\CIVIL\2611005101-C24.DWG

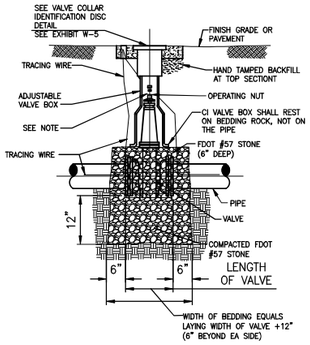
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NOTES:
A. FIRE HYDRANT INSTALLATION SHALL BE IN ACCORDANCE WITH THE CITY'S LAND DEVELOPMENT CODE.
B. 3/4" STAINLESS STEEL ROD CUT AND THREADED AS REQUIRED, OR PROVIDE RESTRAINED JOINTS.
C. FIRE HYDRANTS SHALL BE INSTALLED BETWEEN 3' AND 7' FROM EDGE OF PAVEMENT.
D. TIE RODS, NUTS, WASHERS AND OTHER FASTENERS SHALL BE GALVANIZED OR TYPE 316 STAINLESS STEEL.
E. 4 1/2" PUMPER NOZZLE TO BE PERPENDICULAR TO CENTERLINE OF MAJOR STREET.
F. FIRE HYDRANT ASSEMBLY INCLUDES ALL THAT IS SHOWN INCLUDING DI PIPE TO R/W, DIP TEE AT MAIN, HYDRANT, REDUCERS, VALVE, HYDRANT EXTENSIONS, VALVE EXTENSIONS, ALL PIPING AND MISCELLANEOUS APPURTENANCES REQUIRED FOR A COMPLETE INSTALLATION.
G. FOR FIRE HYDRANTS ALONG PAVED ROADWAYS, INSTALL RAISED PAVEMENT MARKER FOR FIRE HYDRANT IDENTIFICATION. MARKER SHALL BE BLUE AND IN ACCORDANCE WITH FDOT 706. MARKER SHALL BE LOCATED IN THE CENTER OF CLOSEST LANE PERPENDICULAR TO FIRE HYDRANT.

FIRE HYDRANT DETAIL
NTS

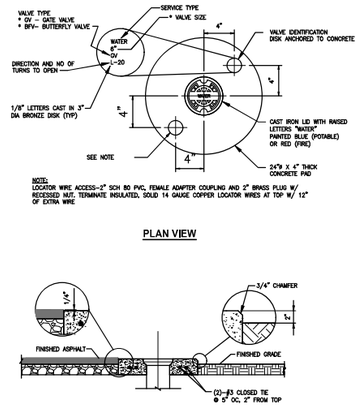
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PHONE (813)780-0029 FAX (813)780-0613
APRIL 2020
W-10



NOTES:
1. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.
2. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.

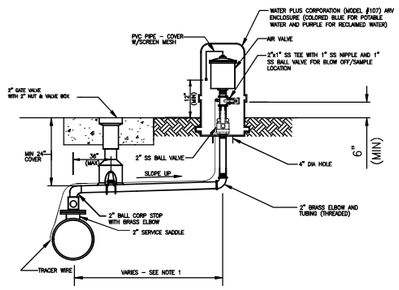
GATE VALVE BOX
NTS

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DECEMBER 2015
W-3



VALVE COLLAR AND IDENTIFICATION DISK
NTS

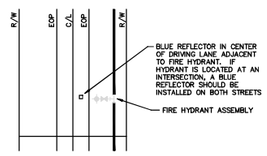
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PHONE (813)780-0029 FAX (813)780-0613
APRIL 2020
W-5



NOTES:
1. OFFSET DISTANCE SHOWN ON DRAWINGS.
2. ADJUST HORIZONTAL LOCATION OF ARV ENCLOSURE, AS REQUIRED TO AVOID SIDEWALK. LOCATE ARV ENCLOSURE WITHIN 1' OF R/W OR AS OTHERWISE DETERMINED BY THE CITY.

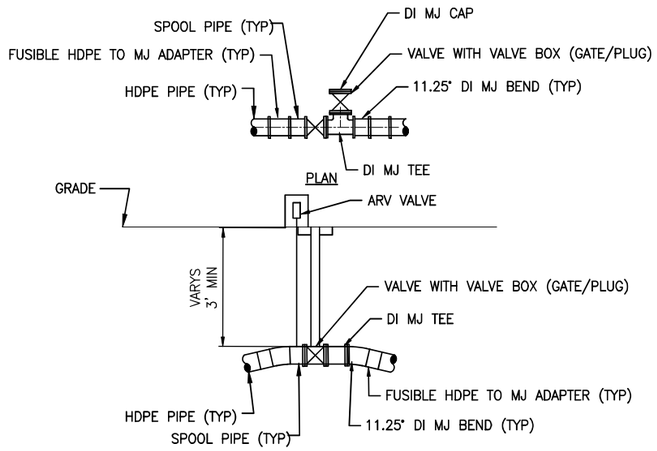
OFFSET AIR VALVE DETAIL
NTS

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FIRE HYDRANT REFLECTOR DETAIL
NOT TO SCALE

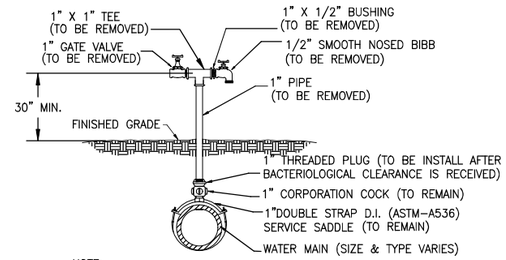
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PHONE (813)780-0029 FAX (813)780-0613
DECEMBER 2015
W-11



SECTION

HDD TO HDD TRANSITION DETAIL (1)
NTS

NOTES:
(1) ALL CONNECTIONS SHALL BE RESTRAINED.
(2) FITTING CALLOUTS AS SHOWN IN DETAIL ARE FOR CONCEPTUAL PURPOSES. SEE PLANS FOR SPECIFIC FITTING CALLOUTS AT HDD TO HDD TRANSITIONS AND OTHER LOCATIONS.



NOTE:
1) LOCATION OF SAMPLE POINT BIBB SHALL NOT BE WITHIN THE ROADWAY BUT ROUTED TO THE ROADWAY SHOULDERS (NON-TRAFFIC AREAS) OF THE ROAD (WHERE APPLICABLE)
2) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL PIPING & FITTINGS NOTED AFTER BACTERIOLOGICAL CLEARANCE IS RECEIVED FROM THE HEALTH DEPARTMENT.

1" BACTERIOLOGICAL SAMPLE POINT DETAIL
N.T.S.

NOTE:
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BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

CIVIL DETAILS

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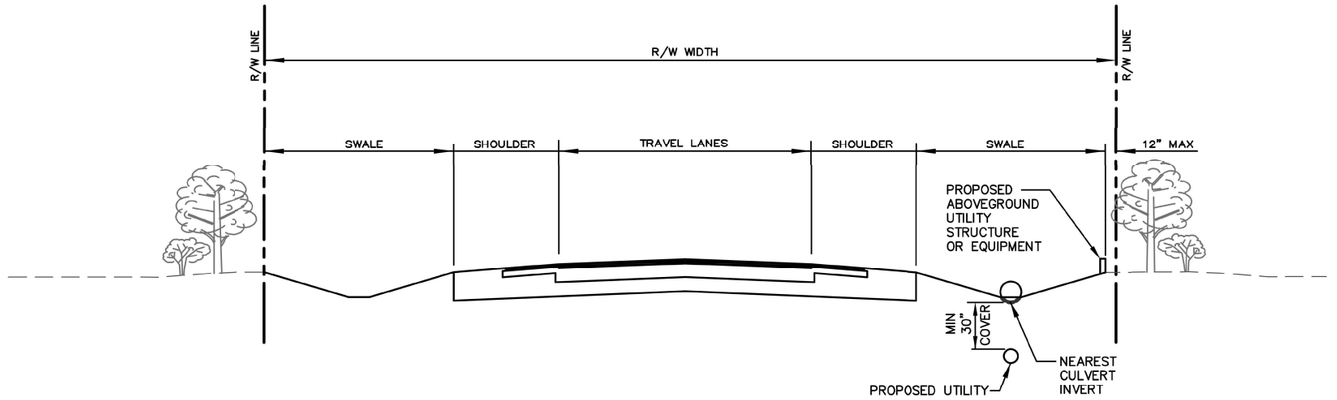
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PROJECT NO: 26110-051-01
DATE: SEPT 2023
INDEX NO:
DWG NO: C25

Approved 2023-H-3-00197 James A. Meyer 11/6/2023

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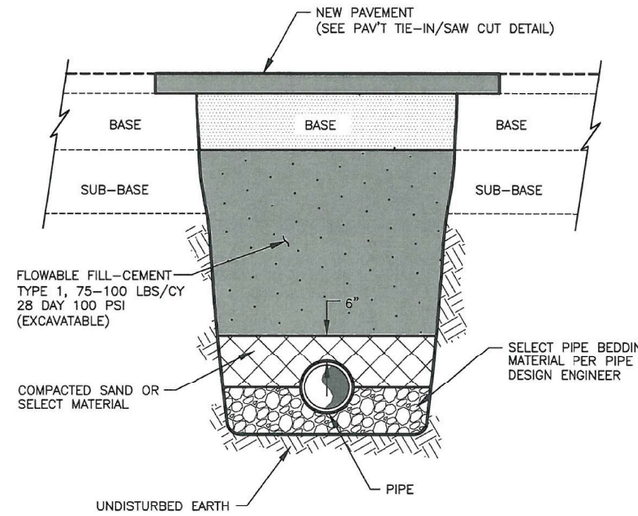


UTILITY INSTALLATION IN SWALE NEAR CULVERT
NTS

NOTE:
NO DEVIATIONS TO THIS DETAIL WILL BE PERMITTED UNLESS APPROVED BY THE COUNTY ENGINEER.
ANY PROPOSED ALTERATIONS SHALL BE CLEARLY IDENTIFIED AND HIGHLIGHTED ON DETAIL.

PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	UTILITY INSTALLATION DETAIL RURAL ROADWAY TYPICAL SECTION		Sheet No. 1 of 1 Index No. 301
	APPROVED BY JCW	BCC APPROVAL REVISED	

C:\Standards-Detail\301_Utility-Install_Culvert.dwg



TYPICAL TRENCH SECTION
NTS

NOTE:
NO DEVIATIONS TO THIS DETAIL WILL BE PERMITTED UNLESS APPROVED BY THE COUNTY ENGINEER.
ANY PROPOSED ALTERATIONS SHALL BE CLEARLY IDENTIFIED AND HIGHLIGHTED ON DETAIL.

PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	FLOWABLE FILL		Sheet No. 1 of 1 Index No. 103
	APPROVED BY JCW	BCC APPROVAL REVISED	

C:\Standards-Detail\103_Flowable-Fill.dwg
09/07/08

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
MSS CHECKED D PLAVCAN

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730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

CIVIL DETAILS

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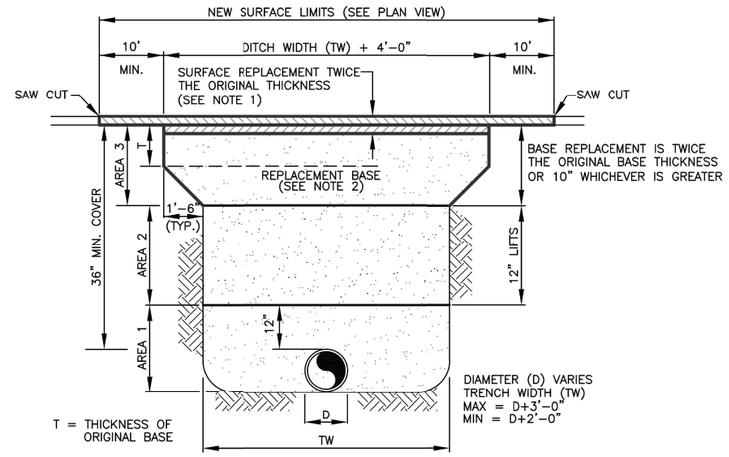
PROJECT NO: 26110-051-01
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INDEX NO:
DWG NO: C26

Approved
2023-H-3003-00197
James A. Meyer
11/6/2023

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NOTES

1. REPLACEMENT ASPHALT SHALL BE TWICE THE ORIGINAL PAVEMENT THICKNESS WITH A MINIMUM OF TWO (2) INCHES AND SHALL BE SP 12.5 OR TYPE S-3 ASPHALT, AND FC-3 IF REQUIRED.
2. REPLACEMENT BASE SHALL BE NEW MATERIAL NOT REUSED FROM EXCAVATION. ACCEPTABLE BASE ALTERNATIVE SHALL BE TYPE ABC OR BETTER ASPHALT PLACED AT A TOTAL THICKNESS OF SIX (6) INCHES.
3. AREA 1 – BACKFILL SHALL BE PLACED IN SIX (6) INCH LIFT WITH EACH LIFT COMPACTED TO **98% OF ASTM FM5-521** USING MECHANICAL TAMPERS.
4. AREA 2 – BACKFILL SHALL BE PLACED IN TWELVE (12) INCH LIFTS WITH EACH LIFT COMPACTED TO **98% OF FM5-521** USING APPROPRIATE COMPACTING EQUIPMENT.
5. AREA 3 – LIMEROCK (LBR 100) BASE SHALL BE CONSTRUCTED IN LIFTS NOT GREATER THAN SIX (6) INCHES COMPACTED THICKNESS, AND HAVE A DENSITY EQUAL TO **98% OF FM5-521**.
6. FLOWABLE FILL MAY BE PLACED ABOVE AREA 1 UP TO THE BOTTOM OF THE RESTORED BASE. MIX DESIGN SHALL CONFORM TO FDOT STANDARD SPECIFICATIONS SECTION 121. IF FLOWABLE FILL IS USED FOR TRENCH BACKFILL, THE AMOUNT OF COVER ABOVE TOP OF PIPE TO AREA 2 MAY BE REDUCED TO 6 INCHES.

Tests shall be submitted to Pasco County Engineering Inspections verifying open cut restoration is per general notes before release of permit or gurantee, if applicable. Material and thickness verification shall be required. All testing shall be Pasco County Services Department Testing Specificatiions for Construction of Roads, Storm Drainage and Utilities; October 2006.

NOTE:
NO DEVIATIONS TO THIS DETAIL WILL BE PERMITTED UNLESS APPROVED BY THE COUNTY ENGINEER.
ANY PROPOSED ALTERATIONS SHALL BE CLEARLY IDENTIFIED AND HIGHLIGHTED ON DETAIL.

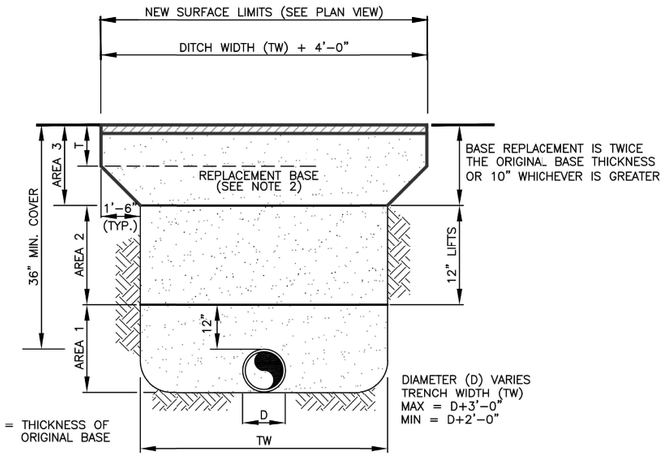
PASCO COUNTY ENGINEERING SERVICES **DESIGN STANDARDS**	**OPEN CUT RESTORATION**		Sheet No. 1 of 1
	APPROVED BY MICHAEL J. GARRETT, P.E.	BCC APPROVAL REVISED	Index No. 102

09/09/08 P:\CAD Support\Details\PROJECT MANAGEMENT STANDARD DETAILS\V22_OpenCut-Restore.dwg

TYPICAL ASPHALT PAVEMENT RESTORATION DETAIL 1

NTS

NOTE:
THE INFORMATION SHOWN ABOVE IS PROVIDED BY PASCO COUNTY. THIS DOES NOT REPRESENT THE WORK PRODUCT OF JONES EDMUNDS AND ASSOCIATES, INC. THEY ARE PROVIDED FOR REFERENCE ONLY AND TO ENSURE COMPLIANCE WITH PASCO COUNTY STANDARDS. UNLESS MODIFIED BY THESE CONTRACT DOCUMENTS, THESE WILL BE THE MINIMUM STANDARDS.



NOTES

1. REPLACEMENT ASPHALT SHALL BE TWICE THE ORIGINAL PAVEMENT THICKNESS WITH A MINIMUM OF TWO (2) INCHES AND SHALL BE SP 12.5 OR TYPE S-3 ASPHALT, AND FC-3 IF REQUIRED.
2. REPLACEMENT BASE SHALL BE NEW MATERIAL NOT REUSED FROM EXCAVATION. ACCEPTABLE BASE ALTERNATIVE SHALL BE TYPE ABC OR BETTER ASPHALT PLACED AT A TOTAL THICKNESS OF SIX (6) INCHES.
3. AREA 1 – BACKFILL SHALL BE PLACED IN SIX (6) INCH LIFT WITH EACH LIFT COMPACTED TO **98% OF ASTM FM5-521** USING MECHANICAL TAMPERS.
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PASCO COUNTY ENGINEERING SERVICES **DESIGN STANDARDS**	**OPEN CUT RESTORATION**		Sheet No. 1 of 1
	APPROVED BY MICHAEL J. GARRETT, P.E.	BCC APPROVAL REVISED	Index No. 102

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TYPICAL LIMEROCK RESTORATION DETAIL 2

NTS

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

CIVIL DETAILS

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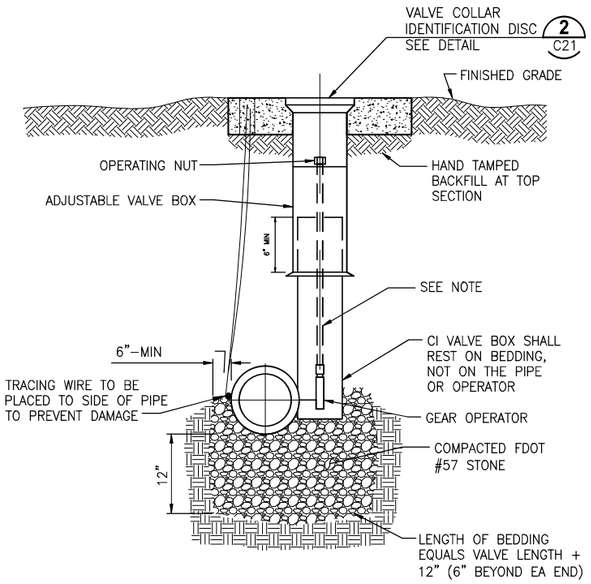
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PROJECT NO: 26110-051-01
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James A. Meyer
11/6/2023

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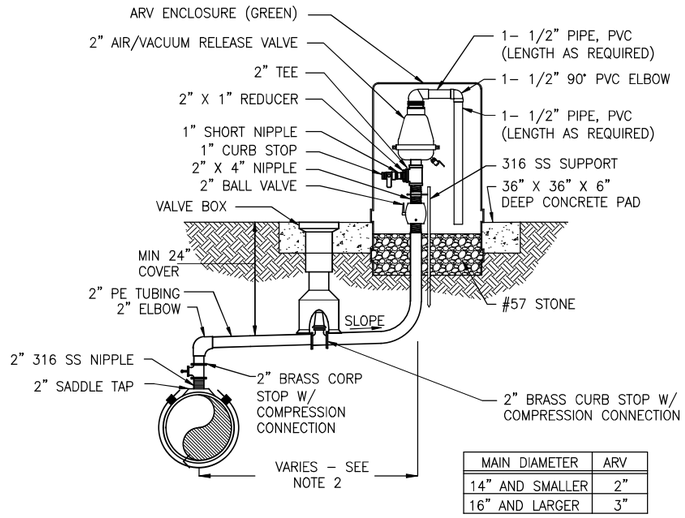
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NOTES:

1. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.
2. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.

PLUG VALVE 1
NTS

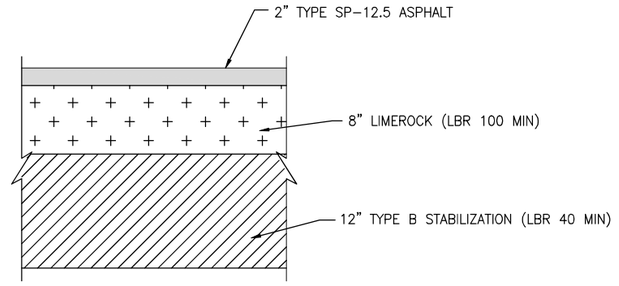


MAIN DIAMETER	ARV
14" AND SMALLER	2"
16" AND LARGER	3"

NOTES:

1. FOR WASTEWATER USE ONLY.
2. OFFSET DISTANCE TO BE FIELD DETERMINED AND AS CLOSE TO THE R/W LINE AS POSSIBLE.
3. ADJUST HORIZONTAL LOCATION OF SIDEWALK, AS REQUIRED TO AVOID ARV ENCLSOURE.
4. LOCATE ARV ENCLOSURE WITHIN 6" OF R/W LINE.

COMBINATION AIR/VACUUM RELEASE VALVE DETAIL 2
NTS



TYPICAL ASPHALT PAVEMENT DETAIL 3
–

BID DOCUMENTS

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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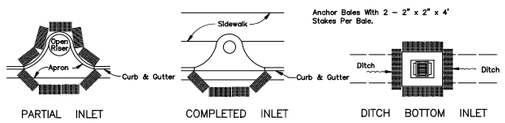
PROJECT NO: 26110-051-01
DATE: SEPT 2023
INDEX NO:
DWG NO: C28

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James A. Meyer
11/6/2023

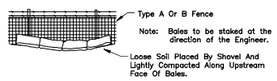
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EROSION AND SEDIMENT CONTROL NOTES

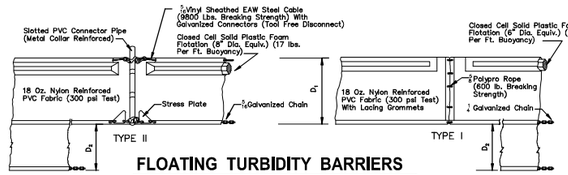
1. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING SILT FROM SITE IF NOT REUSABLE ON-SITE AND ASSURING PLAN ALIGNMENT AND GRADE IN ALL DITCHES AND SWALES AT COMPLETION OF CONSTRUCTION.
2. THE SITE CONTRACTOR IS RESPONSIBLE FOR REMOVING THE TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES AFTER COMPLETION OF CONSTRUCTION AND ONLY WHEN AREAS HAVE BEEN STABILIZED.
3. ADDITIONAL PROTECTION – ON-SITE PROTECTION IN ADDITION TO THE ABOVE MUST BE PROVIDED THAT WILL NOT PERMIT SILT TO LEAVE THE PROJECT CONFINES DUE TO UNSEEN CONDITIONS OR ACCIDENTS.
4. CONTRACTOR SHALL INSURE THAT ALL DRAINAGE STRUCTURES, PIPES, ETC. ARE CLEANED OUT AND WORKING PROPERLY AT TIME OF ACCEPTANCE.
5. WIRE MESH SHALL BE LAID OVER THE DROP INLET SO THAT THE WIRE EXTENDS A MINIMUM OF 1 FOOT BEYOND EACH SIDE OF THE INLET STRUCTURE. HARDWARE CLOTH OR COMPARABLE WIRE MESH WITH 1/2-INCH OPENINGS SHALL BE USED. IF MORE THAN ONE STRIP OF MESH IS NECESSARY, THE STRIPS SHALL BE OVERLAPPED.
6. FDOT NO. 1 COARSE AGGREGATE SHALL BE PLACED OVER THE WIRE MESH AS INDICATED IN D-903. THE DEPTH OF STONE SHALL BE AT LEAST 12 INCHES OVER THE ENTIRE INLET OPENING. THE STONE SHALL EXTEND BEYOND THE INLET OPENING AT LEAST 18 INCHES ON ALL SIDES.
7. IF THE STONE FILTER BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER ADEQUATELY PERFORMS ITS FUNCTION, THE STONES MUST BE PULLED AWAY FROM THE INLET, CLEANED AND REPLACED.
8. BALES SHALL BE EITHER WIRE-BOUND OR STRING-TIED WITH THE BINDINGS ORIENTED AROUND THE SIDES RATHER THAN OVER AND UNDER THE BALES.
9. BALES SHALL BE PLACED LENGTHWISE IN A SINGLE ROW SURROUNDING THE INLET, WITH THE ENDS OF ADJACENT BALES PRESSED TOGETHER.
10. THE FILTER BARRIER SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED TO A MINIMUM DEPTH OF 8 INCHES. AFTER THE BALES ARE STAKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AND COMPACTED AGAINST THE FILTER BARRIER.
11. EACH BALE SHALL BE SECURELY ANCHORED AND HELD IN PLACE BY AT LEAST TWO STAKES OR REBARS DRIVEN THROUGH THE BALE.
12. LOOSE STRAW SHOULD BE WEDGED BETWEEN BALES TO PREVENT WATER FROM ENTERING BETWEEN BALES.
13. STRAW BALE BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
14. CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED BALES, END RUNS AND UNDERCUTTING BENEATH BALES.
15. NECESSARY REPAIRS TO BARRIERS OR REPLACEMENT OF BALES SHALL BE ACCOMPLISHED PROMPTLY.
16. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE STRAW BALE BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.
17. SILT FENCES AND FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
18. SHOULD THE FABRIC ON A SILT FENCE OR FILTER BARRIER DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
19. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-THIRD THE HEIGHT OF THE BARRIER.
20. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.
21. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
22. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
23. THE CONTRACTOR IS RESPONSIBLE FOR FOLLOWING THE BEST EROSION AND SEDIMENT CONTROL PRACTICES AS OUTLINED IN THE PLANS, SPECIFICATIONS AND ST. JOHNS RIVER WATER MANAGEMENT DISTRICT SPECIFICATIONS AND CRITERIA.
24. FOR ADDITIONAL INFORMATION ON SEDIMENT AND EROSION CONTROL REFER TO "THE FLORIDA DEVELOPMENT MANUAL – A GUIDE TO SOUND LAND AND WATER MANAGEMENT" FROM THE STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION (F.D.E.R.) CHAPTER 6.
25. EROSION AND SEDIMENT CONTROL BARRIERS SHALL BE PLACED ADJACENT TO ALL WETLAND AREAS WHERE THERE IS POTENTIAL FOR DOWNSTREAM WATER QUALITY DEGRADATION. SEE DETAIL SHEET FOR TYPICAL CONSTRUCTION.
26. ALL DISTURBED AREAS SHALL BE GRASSED, FERTILIZED, MULCHED AND MAINTAINED UNTIL A PERMANENT VEGETATIVE COVER IS ESTABLISHED.
27. SOD SHALL BE PLACED IN AREAS WHICH MAY REQUIRE IMMEDIATE EROSION PROTECTION TO ENSURE WATER QUALITY STANDARDS ARE MAINTAINED.
28. ANY DISCHARGE FROM DEWATERING ACTIVITY SHALL BE FILTERED AND CONVEYED TO THE OUTFALL IN A MANNER WHICH PREVENTS EROSION AND TRANSPORTATION OF SUSPENDED SOLIDS TO THE RECEIVING OUTFALL.
29. DEWATERING PUMPS SHALL NOT EXCEED THE CAPACITY OF THAT WHICH REQUIRES A CONSUMPTIVE USE PERMIT FROM THE ST. JOHNS RIVER WATER MANAGEMENT DISTRICT.
30. ALL DISTURBED AREAS TO BE STABILIZED THROUGH COMPACTION, SILT SCREENS, HAY BALES, AND GRASSING. ALL FILL SLOPES 3:1 OR STEEPER TO RECEIVE STAKED SOLID SOD.
31. ALL DEWATERING, EROSION, AND SEDIMENT CONTROL TO REMAIN IN PLACE AFTER COMPLETION OF CONSTRUCTION AND REMOVED ONLY WHEN AREAS HAVE STABILIZED.
32. THIS PLAN INDICATES THE MINIMUM EROSION AND SEDIMENT MEASURES REQUIRED FOR THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR MEETING ALL APPLICABLE RULES, REGULATIONS AND WATER QUALITY GUIDELINES AND MAY NEED TO INSTALL ADDITIONAL CONTROLS.
33. THE CONTRACTOR SHALL BE REQUIRED TO RESPOND TO ALL WATER MANAGEMENT DISTRICT INQUIRIES, RELATIVE TO COMPLIANCE OF SJRWMD FOR EROSION AND SEDIMENTATION CONTROL. THE COST OF THIS COMPLIANCE SHALL BE PART OF THE CONTRACT.



PROTECTION AROUND INLETS OR SIMILAR STRUCTURES

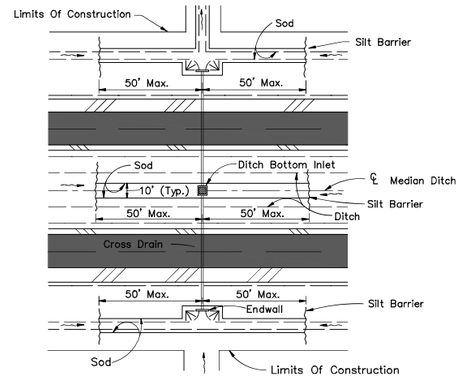


BALES BACKED BY FENCE

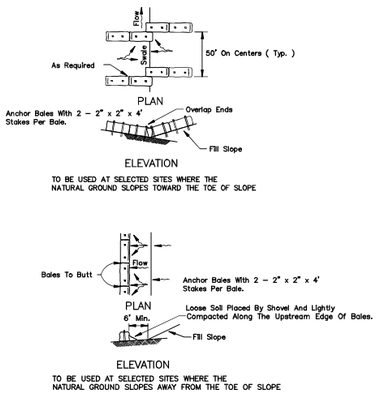


FLOATING TURBIDITY BARRIERS

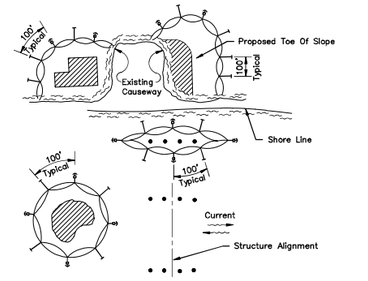
NOTICE:
COMPONENTS OF TYPES I & TYPE II MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES I AND II SHALL BE AS APPROVED BY THE ENGINEER.



DITCH INSTALLATIONS AT DRAINAGE STRUCTURES

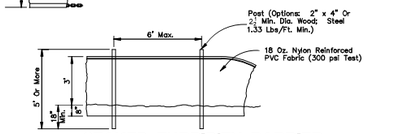


BARRIERS FOR FILL SLOPES

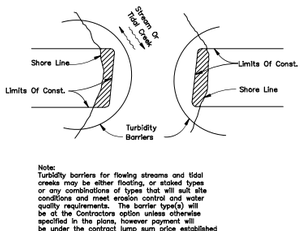


NOTES:
1. Turbidity barriers are to be used in all permanent bodies of water regardless of water depth.
2. Number and spacing of anchors dependent on current velocities.
3. Deployment of barrier around pile locations may vary to accommodate construction operations.
4. Navigation may require segmenting barrier during construction operations.
5. For additional information see Section 104 of the FDOT Standard Specifications.

TURBIDITY BARRIER APPLICATIONS



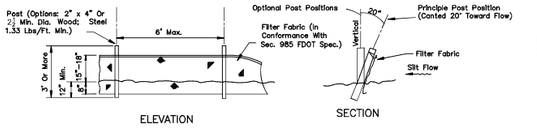
STAKED TURBIDITY BARRIER



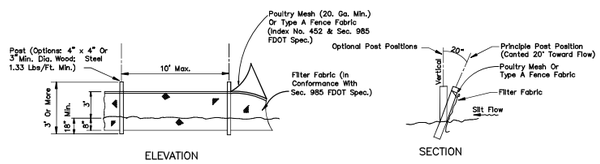
Notes:
Turbidity barriers for flowing streams and tidal creeks may be either floating, or staked types or any combinations of types that will suit site conditions and meet erosion control and water quality requirements. The barrier type(s) will be at the Contractors option unless otherwise specified in the plans, however payment will be under the contract lump sum price established in the bid proposal for Erosion & Sediment Control Posts in staked turbidity barriers to be installed in vertical position unless otherwise directed by the Engineer.

HAY BALE LOCATION

(D-901)
N.T.S.

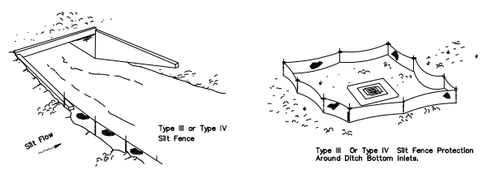


TYPE III SILT FENCE

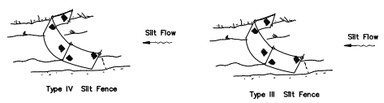


Note: Silt Fence to be paid for under the contract lump sum price for Erosion and Sediment Control.

TYPE IV SILT FENCE



Do not deploy in a manner that silt fences will act as a dam across permanent flowing watercourses. Silt fences are to be used at upland locations and turbidity barriers used at permanent bodies of water.



Note: Spacing for Type III & TYPE IV Fence to be in accordance with Chart 1, Sheet 1 of 3, FDOT Index No. 102 and ditch installations at drainage structures Sheet 2 of 3, FDOT Index No. 102.

SILT FENCE APPLICATIONS

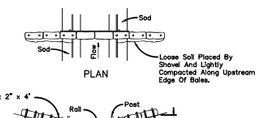
SILT FENCE TYPE III & IV

(D-908)
N.T.S.

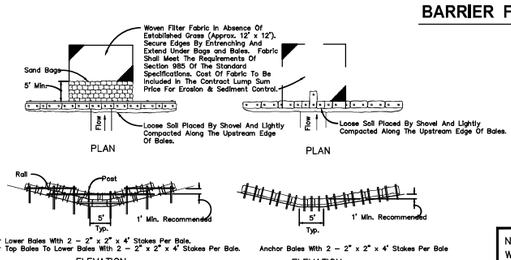
TURBIDITY BARRIER APPLICATIONS

TURBIDITY BARRIERS

(D-907)
N.T.S.



BARRIER FOR PAVED DITCH



Application and Spacing: The use of Types I & II bale barriers should be limited to the conditions outlined in Chart 1, Sheet 1 of 3, Index No. 102

BARRIER FOR UNPAVED DITCHES

NOTE:
WHERE FDOT SPECS AND INDEX ARE REFERENCED, PLEASE REFER TO FDOT ROADWAY & TRAFFIC DESIGN STANDARDS, AND FDOT STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION.

HAY BALE BARRIERS TYPE I & II

(D-912)
N.T.S.

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

STORMWATER POLLUTION PREVENTION DETAILS

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH A. FRASER, PE #57452 ON THE DATE SHOWN ON THE COVER SHEET.

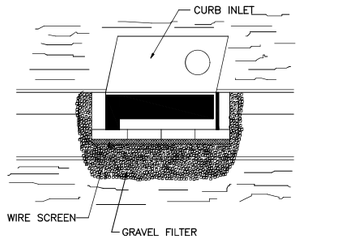
PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

PROJECT NO: 26110-051-01
DATE: SEPT 2023
INDEX NO:
DWG NO: EC1

Approved 2023-H-03-00197 James A. Meyer 11/6/2023

SAVED: 8/11/2023 4:03 PM SSIMS Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\051-01 SOUTH 301 W-WW PIPELINES\DESIGN&CONSTRUCTION\CAD\DWGS\ENV\26110051101-EC02.DWG

© Jones Edmunds 2234

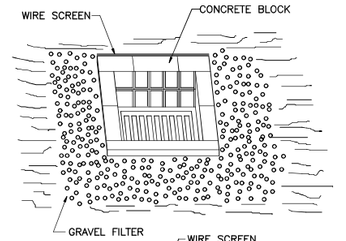


SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE AN OVERFLOW CAPABILITY IS NECESSARY TO PREVENT EXCESSIVE PONDING IN FRONT OF THE STRUCTURE.

BLOCK & GRAVEL CURB INLET SEDIMENT FILTER

(D–902)
N.T.S.



SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.

BLOCK & GRAVEL DROP INLET SEDIMENT FILTER

(D–904)
N.T.S.

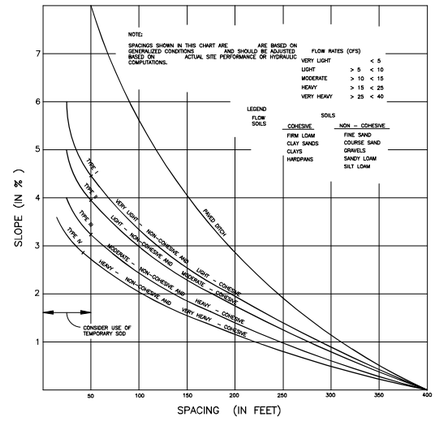
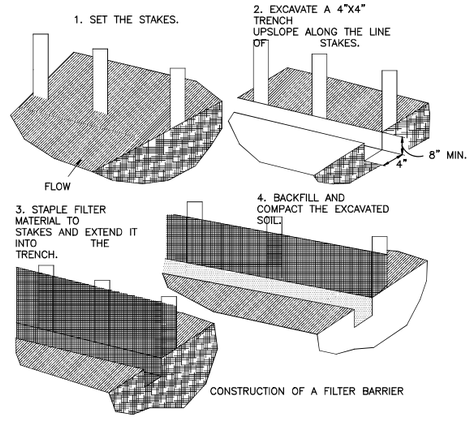


CHART I

RECOMMENDED SPACING FOR TYPE I AND TYPE II HAY BALE BARRIERS, AND TYPE III AND TYPE IV SILT FENCES AND PAVED DITCH HAY BALE BARRIERS

SPACING RECOMMENDATION FOR SILT FENCES & HAY BALES

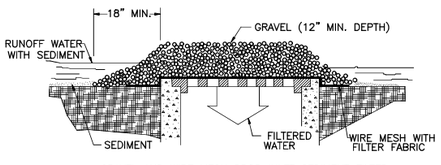
(D–906)
N.T.S.



PROPER PLACEMENT OF A FILTER BARRIER IN A DRAINAGE WAY

FILTER BARRIER CONSTRUCTION DETAIL

(D–910)
N.T.S.



GRAVEL CURB INLET SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE PONDING IN FRONT OF THE STRUCTURE IS NOT LIKELY TO CAUSE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

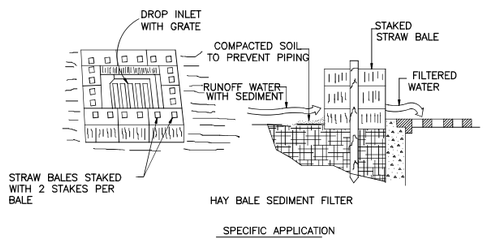
GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY CONCEN– TRATED FLOWS ARE EXPECTED, BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

GRAVEL INLET SEDIMENT TRAP

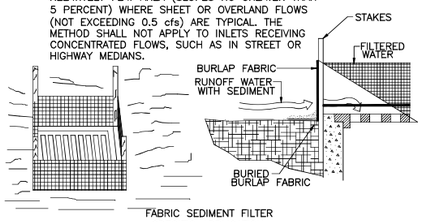
(D–903)
N.T.S.



HAY BALE SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 cfs) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.



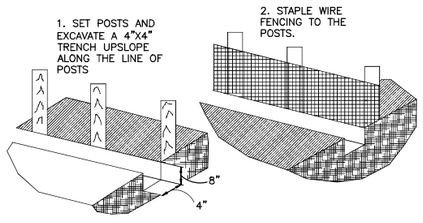
FABRIC SEDIMENT FILTER

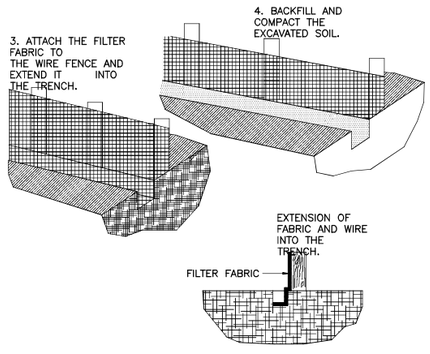
SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 cfs) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS. SUCH AS IN STREET OR HIGHWAY MEDIANS.

DROP INLET SEDIMENT TRAP

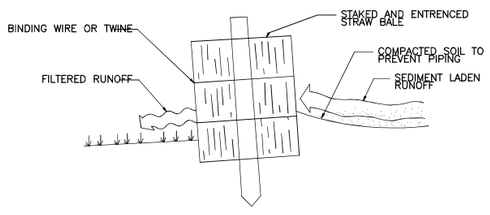
(D–905)





CONSTRUCTION DETAILS FOR SILT FENCES

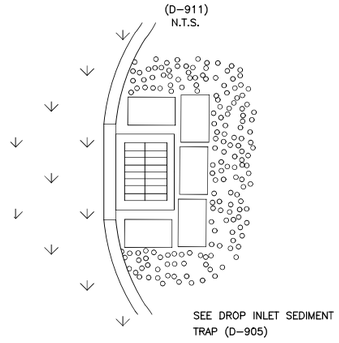
(D–909)
N.T.S.



CROSS–SECTION OF A PROPERLY INSTALLED STRAW BALE

STAKED HAY BALE

(D–911)
N.T.S.



ERECT SEDIMENT BARRIERS AT CATCH BASINS

(TYPICAL)

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

STORMWATER POLLUTION PREVENTION DETAILS

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH A. FRASER, PE #57452 ON THE DATE SHOWN ON THE COVER SHEET.

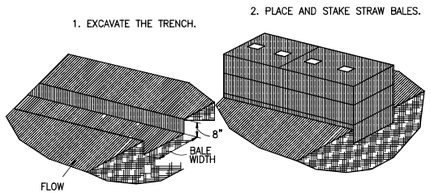
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PROJECT NO: 26110–051–01
DATE: SEPT 2023
INDEX NO:
DWG NO: EC2

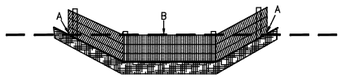
Approved
2023-H-3-00197
James A. Meyer
11/6/2023

SAVED: 8/11/2023 4:05 PM SSIMS Y:\26110–CITY OF ZEPHYRHILLS\PROJECTS\051–01 SOUTH 301 W–WW PIPELINES\DESIGN&CONSTRUCTION\CAD\DWGS\ENV\26110051101–EC03.DWG

PLOTTED: 9/22/2023 3:11:29 PM KENNETH A. FRASER, PE
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CONSTRUCTION OF A HAY BALE BARRIER

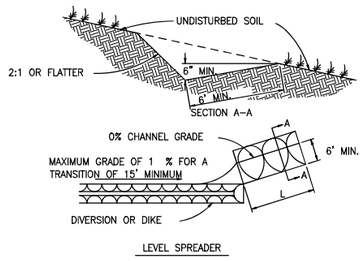


POINTS A SHOULD BE HIGHER THAN POINT B

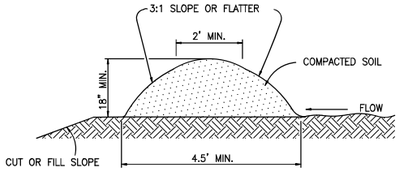
PROPER PLACEMENT OF HAY BALE BARRIER IN DRAINAGE WAY

HAY BALE BARRIER CONSTRUCTION DETAILS

(D-913)
N.T.S.



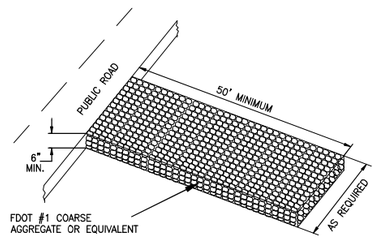
LEVEL SPREADER



TEMPORARY DIVERSION DIKE

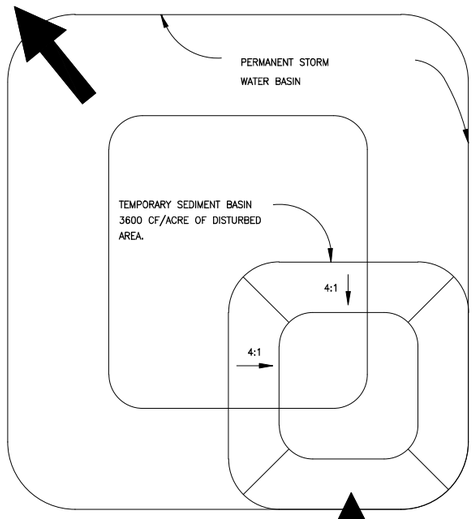
DIVERSION DIKE

(D-914)
N.T.S.



STABILIZED CONSTRUCTION ENTRANCE

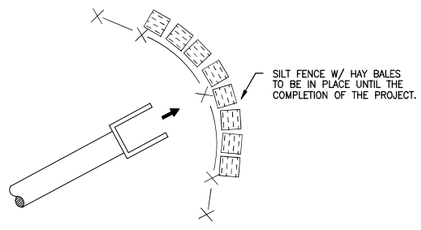
N.T.S.



NOTE: THIS REPRESENT THE OPTIMUM LOCATION OF THE TEMPORARY SEDIMENT BASIN. OTHER ON-SITE LOCATIONS MAY ALSO BE APPROPRIATE.

TEMPORARY SEDIMENT BASIN

N.T.S.



OUTLET PROTECTION

N.T.S.

BID DOCUMENTS

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

STORMWATER POLLUTION PREVENTION DETAILS

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PROJECT NO: 26110-051-01
DATE: SEPT 2023
INDEX NO:
DWG NO: EC3

Approved
2023-H-3-00197
James A. Meyer
11/6/2023

SR 41 (US 301)

TUCKER RD

R/W LINE

+40.21
138.81' LT

+82.30
66.96' LT

+77.09
67.28' LT

+07.05
67.29' LT

+96.03
64.23' LT

+96.02
60.79' LT

+23.67
21.60' LT

+23.67
17.40' LT

+23.67
6.16' LT

+23.67
4.50' LT

END PROJECT
END MILLING & RSF.
STA. 397+23.67

+23.67
4.60' RT

+23.67
5.81' RT

+23.67
18.31' RT

+23.67
23.65' RT

+00.00
1.47' LT

+00.00
0.56' RT

+01.56
35.00' RT

+79.97
35.00' RT

+51.58
58.23' RT

764+86.17
50.00' LT

765+17.30
50.00' LT

HDD

HDD

PT STA. 767+74.26

PT +85.95

℄ SURVEY

N 0°05'44" W

CURVE C2

℄ SR39

CURVE BL SR391

SR 39 / PAUL S. BUCHMAN HWY

393 394 395 396 397 398

764 765 766 767 768 769

B A I

0 10 40
Feet

LEGEND:

(X) PAVEMENT DESIGN SEE TYPICAL SECTIONS

MILLING DEPTHS

1.5-IN

3-IN

4.5-IN

6.5-IN

7-IN

CURVE DATA BL SR391
PI STA. = 767+74.26 (BL SR 39)
Δ = 27° 07' 00" (RT)
D = 2° 00' 00"
T = 690.86
L = 1,355.83
R = 2,864.79
PC STA. = 760+83.40
PT STA. = 774+39.23
e = 0.04 (Exist.)

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS

DATE	DESCRIPTION	DATE	DESCRIPTION

RICHARD C. ENDRZEJEWSKI, P.E.
P.E. LICENSE NUMBER 70853
ELEMENT ENGINEERING GROUP
1713 E. 9th AVENUE
TAMPA, FL 33605

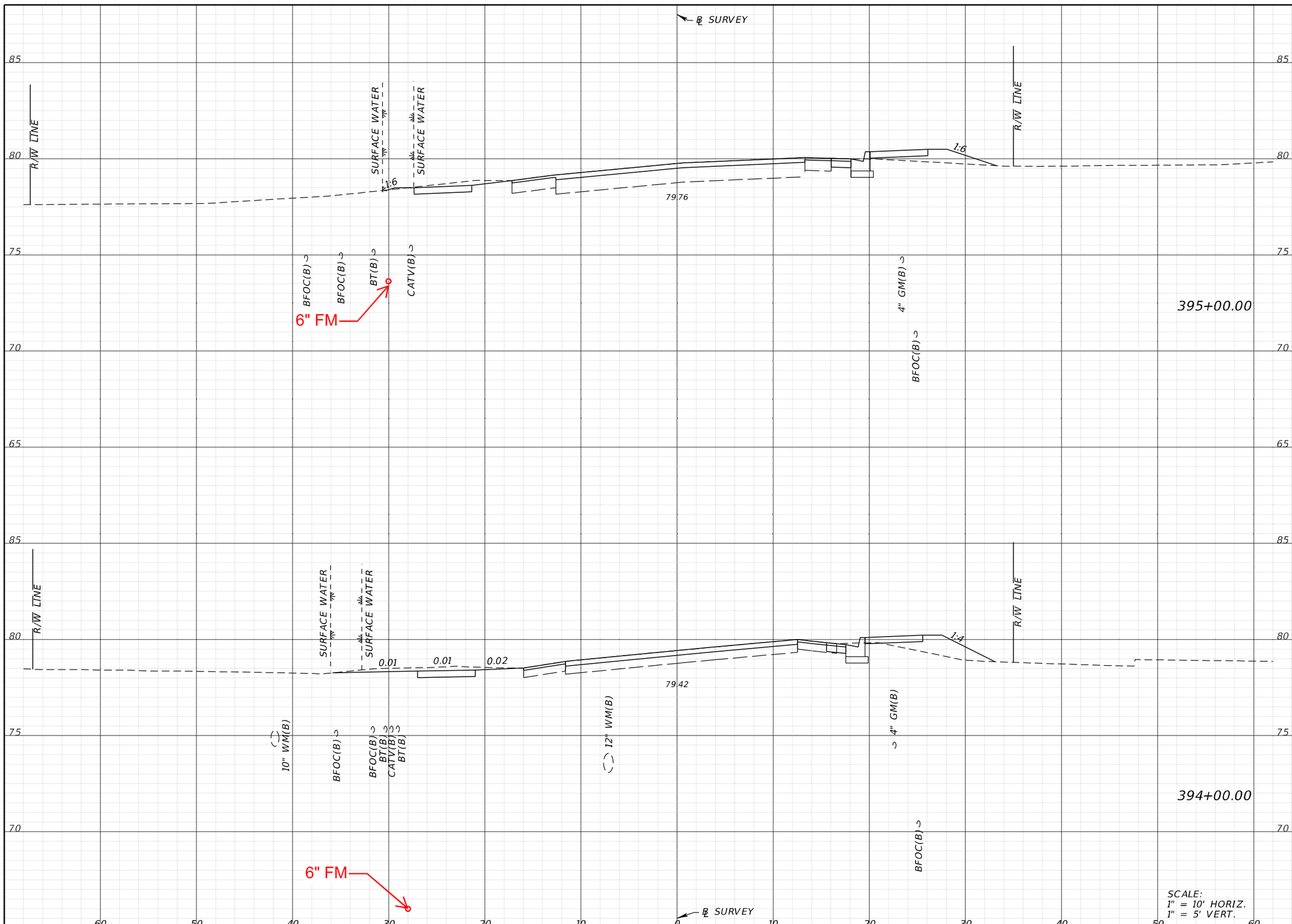
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 41	PASCO	440063-1-52-01

PAVEMENT MILLING DETAILS

SHEET NO. 46

Approved
2023-H-750-00197
James A. Meyer
11/6/2023



Regular Exc.		Embankment	
A	V	A	V
6.31	26.1	4.32	19.6
7.81	49.2	6.28	14.3

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RICHARD C. ENDRZEJEWSKI, P.E.
P.E. LICENSE NUMBER 70853
ELEMENT ENGINEERING GROUP
1713 E. 9th AVENUE
TAMPA, FL 33605

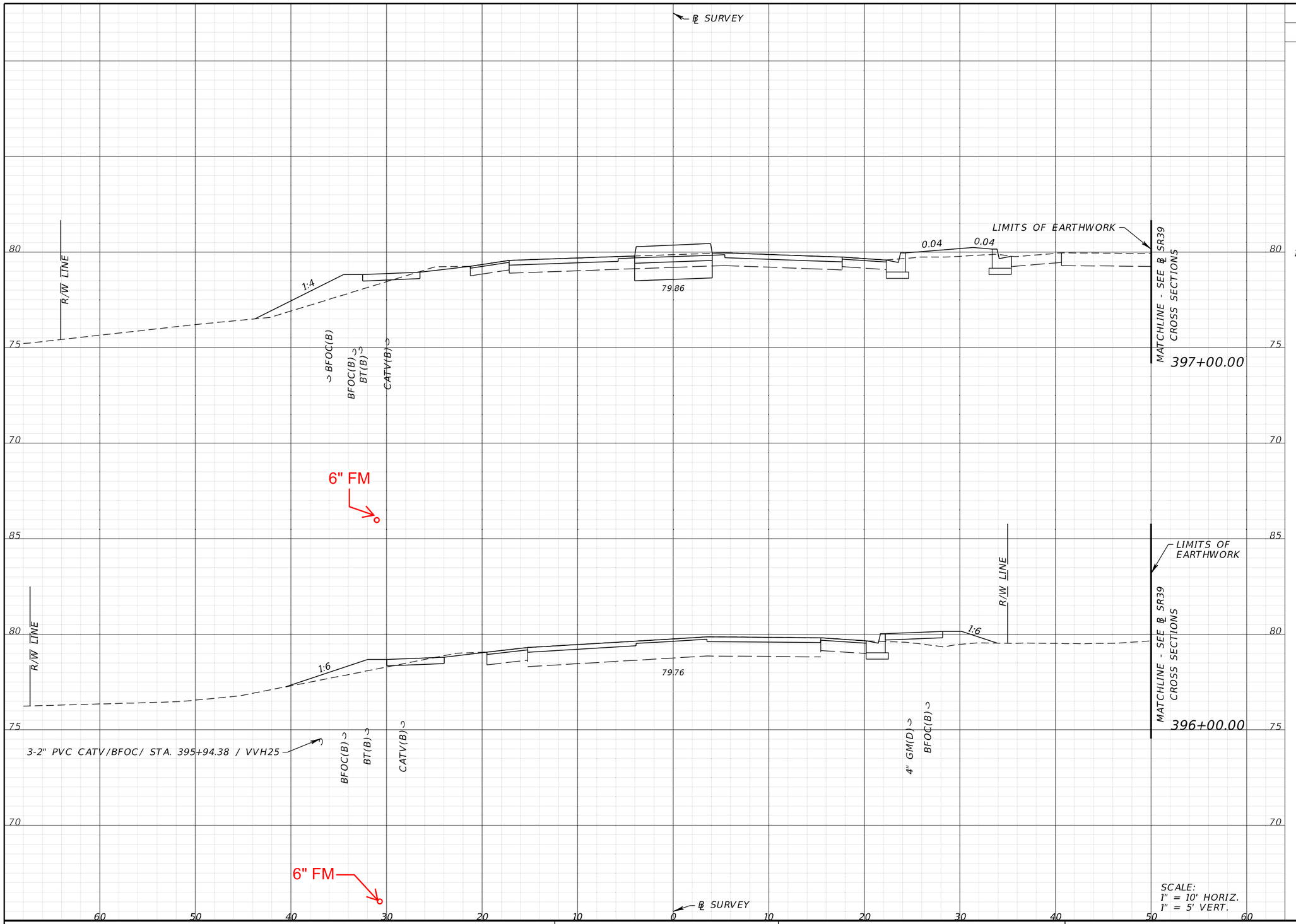
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 41	PASCO	440063-1-52-01

CROSS SECTIONS

SHEET NO. 135

Approved
2023-H-79-00197
James A. Meyer
11/6/2023



Regular Exc.		Embankment	
A	V	A	V
15.80	35.6	11.28	35.0
3.42	18.0	7.64	22.1

SCALE:
1" = 10' HORIZ.
1" = 5' VERT.

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RICHARD C. ENDRZEJEWSKI, P.E.
P.E. LICENSE NUMBER 70853
ELEMENT ENGINEERING GROUP
1713 E. 9th AVENUE
TAMPA, FL 33605

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 41	PASCO	440063-1-52-01

CROSS SECTIONS

SHEET NO. 136

Approved
2023-H796-00197
James A. Meyer
11/6/2023

mknight 3/28/2023 11:40:22 AM Rdxsrd_shg P:\FDT210\CADD\4400631520\roadway\rdxsrd_shg

M E M O R A N D U M

FLORIDA DEPARTMENT OF TRANSPORTATION
District Utilities MS 7-820

DATE: 11/06/2023

TO: Tyler Matthews, Brooksville Operations Engineer
Alejandro Pina, Brooksville Construction Engineer

FROM: Joe Goddard, Utility Construction Manager Joe Goddard

COPIES: Marty Davis, Construction Project Administrator
Zachary Stringer, Construction Manager Project File

SUBJECT: FPN: 440063-1-52-01
Permit No. 2023-H-798-00197

Please find attached the Utility Permit on the above referenced project from the City of Zephyrhills.

The scope of work under this permit is for adjustment of existing facilities along the US 301/SR 41 corridor to accommodate the proposed FDOT improvements. The installation has been reviewed with the Construction Resident Office and special requirements are listed below.

- City of Zephyrhills representatives will need to contact Joe Goddard (727-543-3614) 7 days prior to beginning utility installations.

The Zephyrhills pipeline project is on a 15-month construction schedule as follows:

- **First week of January 2024: begin shop drawing review and material procurement. (3 months)**
- **March 2024: begin construction at the northernmost end of the construction corridor. (12 months)**

With the Tucker-road crossing at the southernmost end of the project, it is anticipated this section of the project would not be impacted until the fall of 2024.

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

M E M O R A N D U M

FLORIDA DEPARTMENT OF TRANSPORTATION
District Utilities MS 7-820

- Please ensure the City of Zephyrhills is clear of drainage structures & drainage pipe throughout the project limits. Along with understanding the size of the structures that will be installed and needing proper shoring and stabilizing methods with the surrounding areas around the structure, and clear of Light Pole and Mast Arms Foundations throughout the project.

- Be aware that the facilities that the City of Zephyrhills is installing are for the UAO's benefit. They are aware of the upcoming FDOT projects and that any placements within this permit will be relocated at the UAO's cost in coordination with the proposed upcoming road improvement project 440063-1.

- Please provide certified as-built data on the approved submitted FDOT plan sets of City of Inverness underground installations, within 45 days after completion. (ie. Elevation, offsets, & stationing)

Upon Final execution of this permit, please forward the District Utilities' copy to the Construction office indicated above with a copy of this memo attached.

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

SEE THE PERMIT - PART 2: Engineer responsible for inspection, PART 3: Completion date, PART 4: General Provisions, PART 5: Special Provisions.

SPECIAL PROVISIONS

This Permit subject to the following provisions, conditions and stipulations: This Permit issuances DOES NOT in any way approve the applicant's plan.

1. **Notification:** Contact the Florida Department of Transportation (FDOT) 48 hours before starting construction. (A pre-construction meeting and **liability insurance is required for all permits –see Permit Category, Permit page 1, part 1 Permit Information).**

   Contact: James Meyer, Permits Manager OR David Skrelunas Brooksville Operations Program Engineer
   16411 Spring Hill Dr. Brooksville, FL.34604 * 352- 848-2600 Monday -Thursday 7:00 A.M. to 5:30 P.M.
2. **Work and Material Standards -Specifications:** ***The FDOT standards, specifications and Permit take priority over the permittee's plans.*** All construction work and materials must (mandatory) be FDOT certified and in conformance with the latest edition of the FDOT *Standard Plans for Road and Bridge Construction (Standard Plans), Utility Accommodation Manual, Standard Specifications (Spec.s), Florida Design Manual* and *Flexible Pavement Design Manual for New Construction and Pavement Rehabilitation*.
3. **Maintenance of Traffic:** All Maintenance of Traffic (TTC) signs and markings (including for bicycles, sidewalks and pedestrians), for lane/road closures, detours and right of way work for construction and/or maintenance must be in conformance with the *Standard Plans 102 - 600 series (use appropriate SP for the work type - multi or two lanes, urban or rural roadways).* All work only during daytime unless otherwise approved, and off-peak work hours may be required. All night work or overnight MOT must be approved by the FDOT. Submit lane closure calculations as required. All MOT must be set up and maintained by a certified MOT work site safety supervisor.
4. **Driveway/Connection Design:** The driveway must be in conformance with the *Standard Plans 000-515* (Rural or Urban) including the radius, slopes and remove/replace the paved shoulder in front of the driveway (see Pavement Structure) to a matching roadway structural section. The driveway profile grade maximum is 10% for commercial and 28% for residential. Urban flared driveway with sidewalk must have the correct walkaround, flares, slopes, ramps and detectable warnings. See *Standard Plans 522-001, 522-002 and 000-515 sheets 2,3,4 of 7.*
5. **Roadway Widening Design:** All rural or urban roadway widening for more lanes in conjunction with a driveway must match existing roadway and slope (usually 2-3%) with a 11 feet wide outside paved shoulder (usually 5 feet wide with 6% slope paved and 6 feet wide 6% slope unpaved shoulder, left turn lane shoulders match existing median shoulders). The shoulder front ditch slope is usually 1 (rise) to 6 (run). Maintain clear recovery zone distances and if required use guardrails and handrails for excessive slopes and obstructions. The widening approach solid/skip striping pattern must be in conformance with *Standard Plan 711-001, sheet 5-14.*
6. **Drainage - Mitered End Sections:** All project drainage should be away from the FDOT roadway and right-of-way. The connection must drain away from the roadway for at least 5 feet. A Drainage Permit or exemption is required for any drainage work within or discharge to the FDOT right of way. The driveway and mitered end section *(Standard Plan 430-022)* including (correctly sized with beveled/radii corners and splash pads), pipe size and type, shoulder width and 1v:4h side slopes must be in conformance with *Standard Plan 430-022, 430-001 and 000-515.* All other drainage work and materials must be in conformance with F.D.M. and *Standard Plan 425-001 to 524-001*.
7. **Construction Stages –Time Period:** The permittee's engineer is responsible for inspection. All construction must be done in stages with each stage (for example) subgrade, base, etc. inspected and approved by the FDOT (or the inspection must be waived by the FDOT) before starting the next stage. Complete the construction in a timely manner and within one year of issuance as noted on the permit.
8. **Turn Lanes - Sight Distance:** The median opening and spacing, left turn lane transitions, queues and lengths must be in conformance with FDM. The sight distance and length must be in conformance with FDM.
9. **Signs and Striping:** All traffic signs, striping, raised pavement markers and pavement markings must be in conformance with FDOT Standard *Plan 11000 and 17000 series*. See *Standard Plan* for pavement markings, thermoplastic and traffic signs. Apply thermoplastic 14 days (no wait for concrete) after paving and apply interim striping until thermoplastic is applied. Remove existing striping by mill and resurface with matching asphalt (water blasting and grinding are not allowed). A rural commercial driveway must have at a minimum a high intensity reflective 36" R1-1 STOP sign with a 24" wide stop bar located between 12-25 feet away from the roadway.
10. **Sod and Erosion Control**: All areas in the right of way disturbed during construction must be restored, compacted, sodded and watered in conformance with the *Standard Specifications, Section 104* and *Standard Plan 570-001, 570-010.* Excess shoulder lime rock must be removed or mixed with a sufficient amount of soil and fertilizer to ensure growth. During construction install erosion control, silt fences, turbidity barriers etc. in conformance with *Standard Specifications, Section 104*, NPDES/DEP and SWPPP (Stormwater permit/plan) requirements.
11. **Pavement:** The mainline widening etc. (and the mainline shoulder in front of the connection must be removed and replaced), MUST match the mainline thickness, type of stabilization, base and structural course, friction course (FC), and aggregates etc. (course or fine graded), unless otherwise directed by the FDOT/engineer. Submit approved testing laboratory certification for the design mix and density test results. The density tests must be a minimum of 3 per section of widening for each lift, unless otherwise directed by the FDOT/engineer. The paving seam lines must align with striping, and if needed use compatible mill and overlay, resurface, leveling etc., over entire existing roadway to reduce old/new pavement joints. **Driveway Pavement:** The minimum driveway pavement section: (this driveway pavement is not for the mainline and does not replace a better or match existing pavement or as specified by the FDOT/engineer. For roadway widening see Pavement Design Manual design criteria; traffic volumes, rural/urban, multi/single lanes, loads, soil, speed etc.):

    A. Sub-base: Stabilized 12 inch below the base* or ***Skip to Option A-1***
    Base: 8-inch-thick primed lime rock (double course – 4-inch lifts) or B-12.5 (Superpave asphalt base) if required
    Surface: 1.5-inch-thick asphalt type SP or type S (and **FC shoulder as needed) (and/or match existing structural & FC)

    A-1. Sub-base: No sub grade is required
    Base: 12-inch-thick primed lime rock (6-inch lifts) * or B-12.5 (Superpave asphalt) if required (1.5 x 8" = 12" base)
    Surface: 1.5-inch-thick asphalt surface type SP or type S and **FC as needed (and/or match existing structural & FC)

    or B. Sub-base: No compaction specified*
    Base: 8-inch-thick Sand Asphalt Hot Mix (triple course – 3 lifts) 800 lb. stability
    Surface: 1.5-inch-thick asphalt type SP or type S and **FC as needed

    or C. 6-inch-thick of FDOT approved Class I 3000 psi concrete (6" for traffic bearing & 4" for sidewalk) on suitable soil with expansion joints as required. See *Standard Specifications 346 and 350*

    * The sub-base (stabilization) must extend 4 inches beyond the base above and/or the base must extend 4 inches beyond the pavement section above (or 4 inches beyond back of curb)
    **The FC may not be required on low volume/speed driveways beyond the mainline shoulder, providing the mainline and driveway surface difference ("lip") does not exceed the limit.
12. **Lime rock Base:** The lime rock base material must be from a FDOT approved source. At no time must a lift course thickness exceed 6 inches. The lime rock base must be in conformance with FDOT *Design Standards 514* and *Standard Specifications, Section 200.* The Type B-12.5 asphalt black base may be required by the FDOT to expedite work or for wet conditions etc.
13. **Site/Other Approvals/Permits**: The permittee must comply with all federal, state, county and local ordinances with proof of local site plan approval, Southwest Florida Water Management District and Turnpike District permits/approval, utility company notifications/locates and coordination with other FDOT projects etc. This connection must not be of any cost to the FDOT or interfere with other or FDOT projects.
14. **Easements/Dedications:** The permittee/engineer must ensure that all easements and dedications are recorded and submitted to FDOT before final acceptance of the permit.
15. **Quality Control and Acceptance:** The permittee and/or permittee's engineer is/are responsible for inspecting the work and material's and meet all FDOT indices, standards, specifications, conditions, qualified/approved/certified products and provisions of the permit. Submit a *Record Drawings Report by Permittee's Professional Engineer* (FDOT form 850-040-19) and AS BUILTS (if needed). The permit issuance

Authorized
2021.05.18 08:09:37
James A. Meyer

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

does not relieve the permittee, contractor and engineer from complying with FDOT requirements. The FDOT must accept the driveway BEFORE the driveway may be used. G:\PermitACCESS\Brooksville Forms\Permit Attachments - FDOT Attach this for permit issueance\PERMIT ATTACHMENT Special Provisions.doc

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2023-H-798-00197
James A. Meyer
11/6/2023

NOTES:

1. Cover or deactivate pedestrian traffic signal display(s) controlling closed crosswalks.

2. Place pedestrian LCDs across the full width of the closed sidewalk.

3. For post mounted signs located near or adjacent to a sidewalk, maintain a minimum 7' clearance from the bottom of the sign panel to the surface of the sidewalk.

4. "Sidewalk Closed" signs (R9-XX) may be mounted on pedestrian LCDs in accordance with the manufacturer's instructions.

5. Omit the Advance Closure LCD if it blocks access to other pedestrian facilities (e,g,, transit stops, residences, or business entrances).

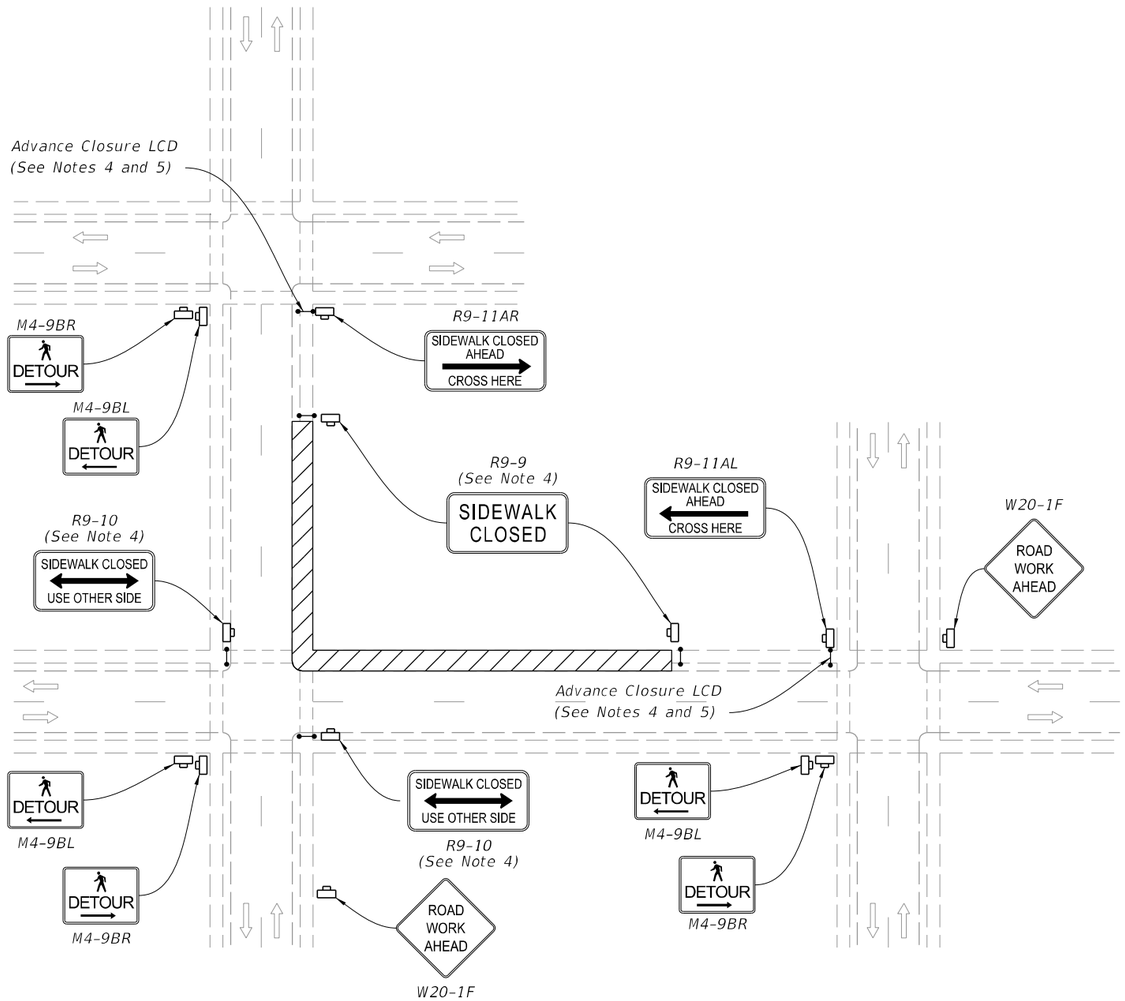
SYMBOLS:

Work Area

Work Zone Sign

Pedestrian Longitudinal Channelizing Device (LCD)

Lane Identification and Direction of Traffic



PEDESTRIAN DETOUR

9/21/2021 12:26:54 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	SIDEWALK CLOSURE	INDEX	SHEET
11/01/20						102-660	1 of 2

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11/6/2023

NOTES:

1. L = Taper Length
   B = Buffer Length
   X = Work Zone Sign Distance
   See Index 102-600 for "L", "B", "X", channelizing device spacing values.

2. Provide a 5' wide temporary pedestrian way with a maximum cross-slope of 0.02, except where space restrictions warrant a minimum width of 4'. Provide a 5' x 5' passing space for temporary pedestrian ways less than 5' in width at intervals not to exceed 200'.

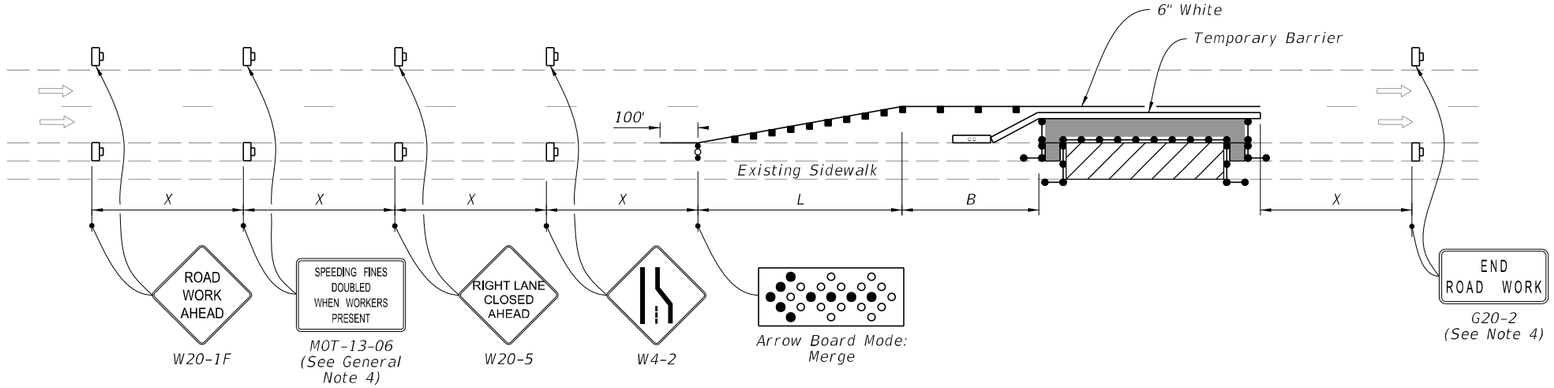
3. When temporary pedestrian ways require curb ramps, meet the requirements of Index 522-002. Detectable warnings are not required for curb ramps diverting pedestrian traffic into a closed lane.

4. The "Speeding Fines Doubled When Workers Present" signs (M0T-13-06) and "End Road Work" signs (G20-2), along with associated work zone sign distances, may be omitted when the work operation will be in place for 24 hours or less.

5. Pedestrian Diversion Option 2 may only be used when called for in the Plans or as approved by an Engineer.

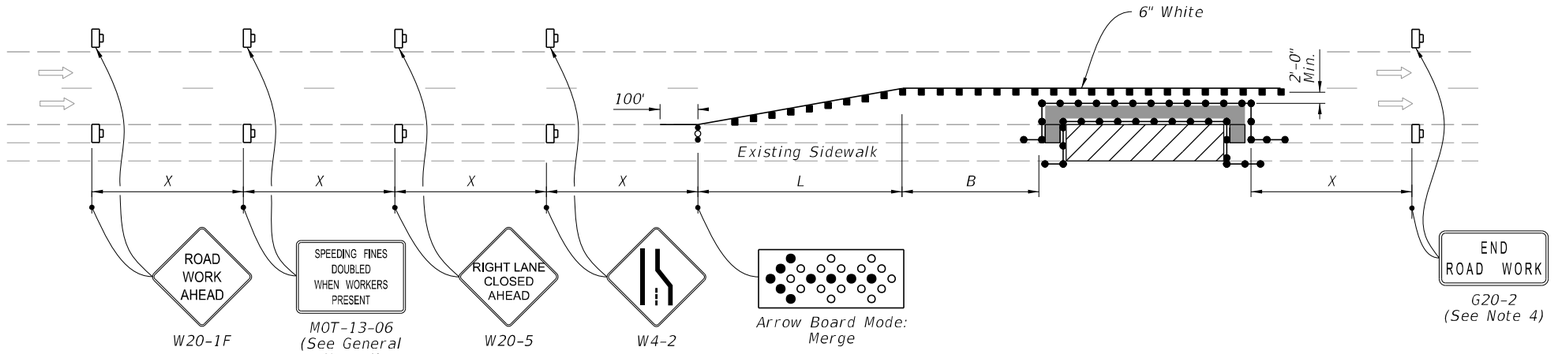
SYMBOLS:

- Work Area
- Temporary Pedestrian Way
- Channelizing Device (See Index 102-600)
- Pedestrian Longitudinal Channelizing Device (LCD)
- Work Zone Sign
- Arrow Board
- CC Crash Cushion
- Lane Identification and Direction of Traffic



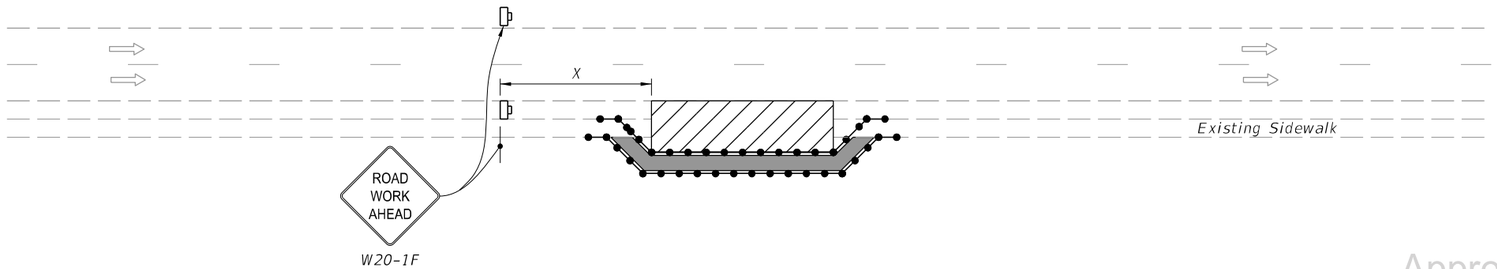
PEDESTRIAN DIVERSION - OPTION 1

(Temporary Barrier Shown, Low Profile Barrier Similar)



PEDESTRIAN DIVERSION - OPTION 2

(Work Zone Speed 35 mph or Less)

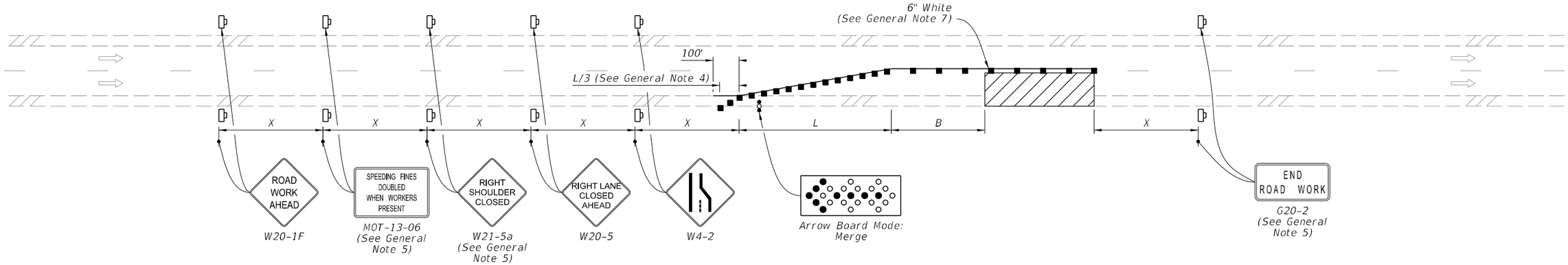


PEDESTRIAN SPECIAL DETOUR

9/21/2021 12:26:55 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	SIDEWALK CLOSURE	INDEX	SHEET
11/01/21						102-660	2 of 2

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11/6/2023



SINGLE LANE CLOSURE

SYMBOLS:

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Arrow Board
- Lane Identification and Direction of Traffic

GENERAL NOTE:

1. L = Taper Length
   B = Buffer Length
   X = Work Zone Sign Distance
   See Index 102-600 for "L", "B", "X", and channelizing device spacing values.

2. On undivided highways the median signs as shown are to be omitted.

3. On limited access facilities, omit "Right Shoulder Closed" signs (W21-5a) and associated work zone sign spacing distances.

4. If the paved shoulder is less than 4' in width, omit the taper and channelizing devices from the paved shoulder.

5. The "Speeding Fines Doubled When Workers Present" signs (MOT-13-06) and "End Road Work" signs (G20-2) and "Right Shoulder Closed" (W21-5a), along with associated work zone sign distances, may be omitted when the work operation will be in place for 24 hours or less. For Single Lane Closures, arrow boards and buffer (B) may also be omitted when the work operation will be in place for 60 minutes or less and the speed limit is 45 mph or less.

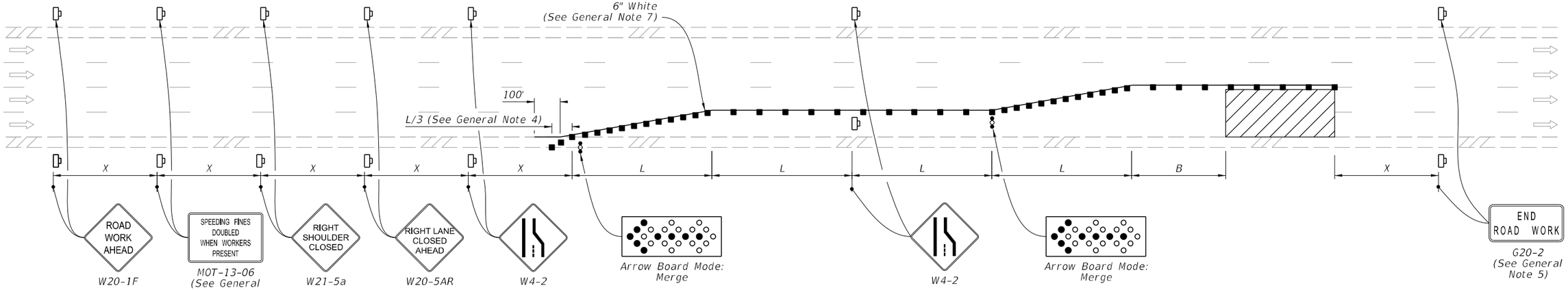
6. Use inverted plan of the illustrations for work on left side of roadways.

7. Temporary pavement markings may be omitted when the work operation is in place for 3 days or less.

12/16/2021 7:13:18 AM

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James A. Meyer
11/6/2023

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	MULTILANE ROADWAY, LANE CLOSURES	INDEX	SHEET
11/01/21						102-613	1 of 5



DOUBLE LANE CLOSURE

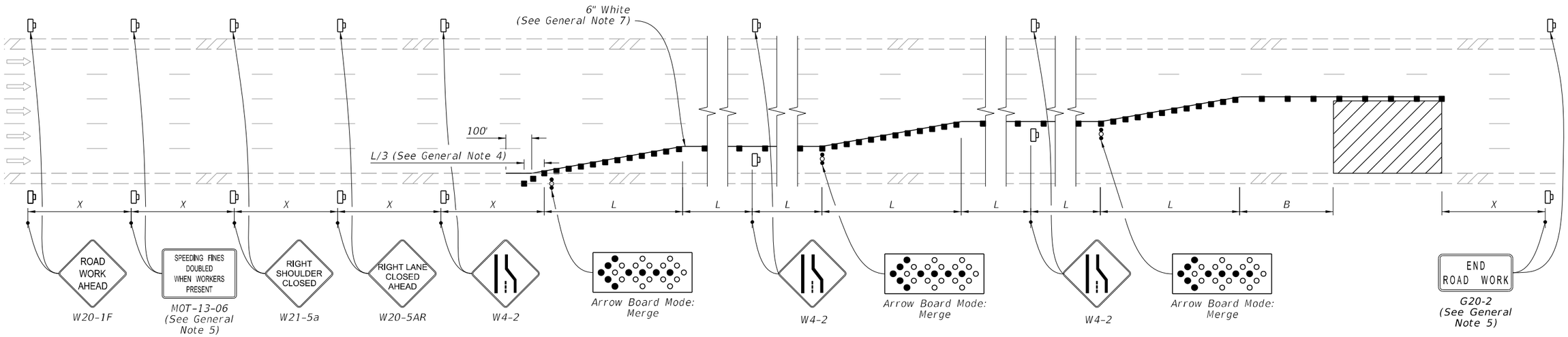
SYMBOLS:

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Arrow Board
- Lane Identification and Direction of Traffic

12/16/2021 7:13:19 AM

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2022-23 STANDARD PLANS	MULTILANE ROADWAY, LANE CLOSURES	INDEX	SHEET
11/01/20					102-613	2 of 5

Approved
2023-H-798-00197
James A. Meyer
11/6/2023



TRIPLE LANE CLOSURE

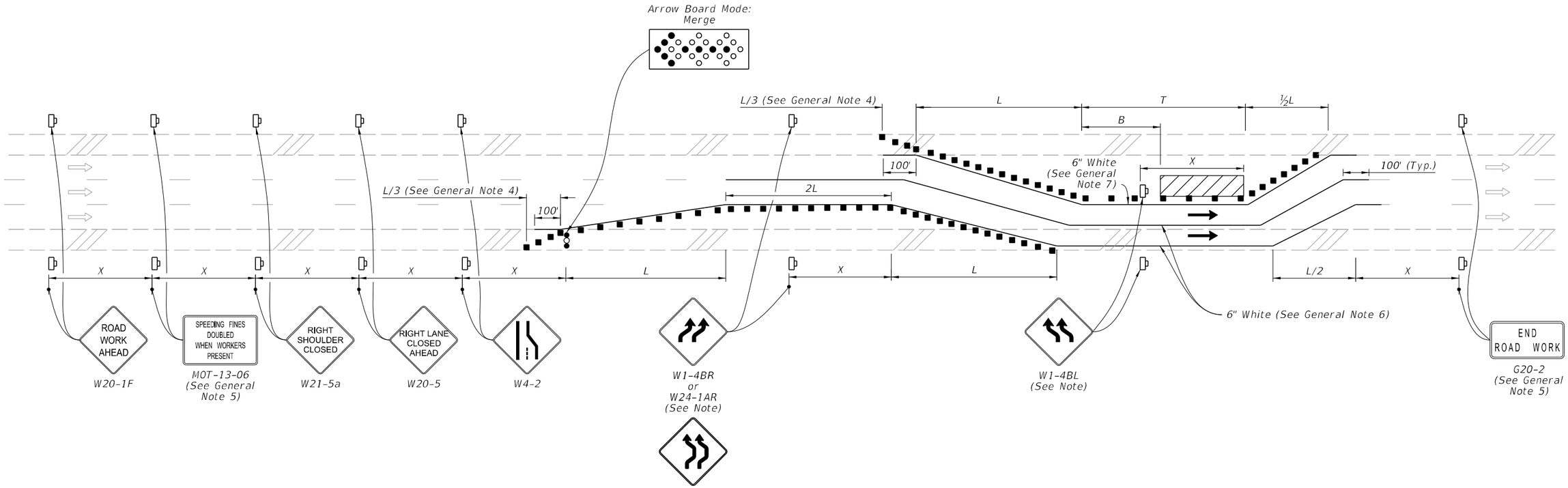
SYMBOLS:

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Arrow Board
- Lane Identification and Direction of Traffic

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James A. Meyer
11/6/2023

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	MULTILANE ROADWAY, LANE CLOSURES	INDEX	SHEET
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LANE CLOSURE WITH LANE SHIFT

NOTE:

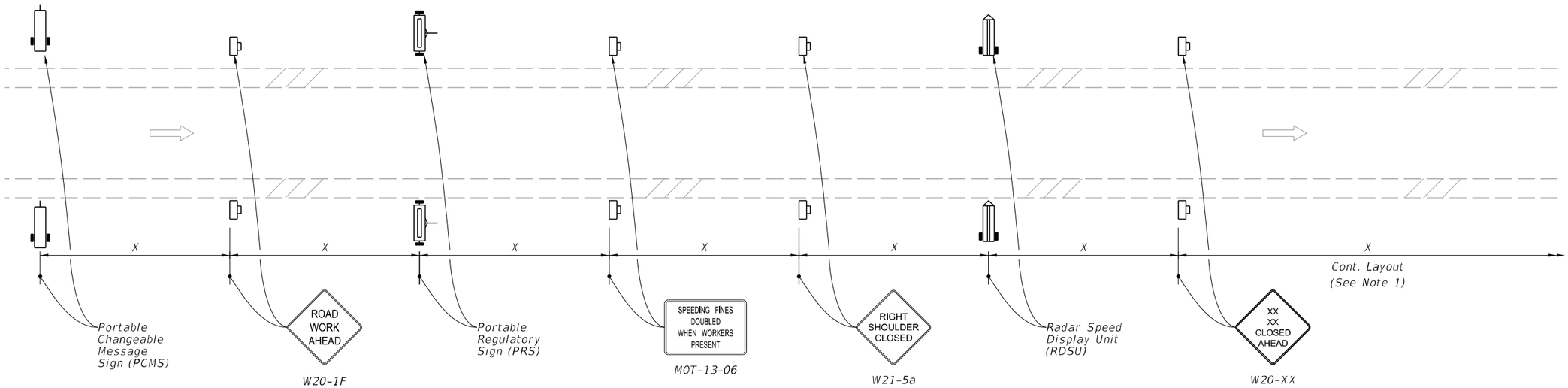
If the tangent distance "T" is less than 600', then use "Double Reverse Curve" signs (W24-1A) instead of the first pair of "Reverse Curve" signs (W1-4B) and omit the second pair of "Reverse Curve" signs.

SYMBOLS:

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Arrow Board
- Lane Identification and Direction of Traffic

12/16/2021 7:13:20 AM

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11/6/2023



MOTORIST AWARENESS SYSTEM

SYMBOLS:

Work Zone Sign

(1) PCMS= Portable Changeable (Variable) Message Sign

(2) PRS= Portable Regulatory Sign-Speed Limit When Flashing

(2) RSDU= Radar Speed Display Unit

Lane Identification and Direction of Traffic

NOTES:

1. Use the Motorist Awareness System (MAS) for lane closures of at least 5 days (consecutive or not) on multilane divided facilities with a posted speed of 55 or greater when workers are present and not protected by a barrier.

2. Locate the Motorist MAS devices (i.e., PCMS, PRS, and RDSU) within the advance warning signs as shown. Continue with the remainder of the work zone signs and devices in accordance with the Plans or Standard Plans after the appropriate "Lane Closed Ahead" (W20-XX) sign.

3. For a posted speed of 65 mph or greater, display speed with a ten mph reduction. For a posted speed of 60 mph, display a reduced speed of 55 mph. For areas outside of the lane closure, use the posted speed as the work zone speed.

4. Omit the PCMS in the median for roadways with three lanes or less in the same direction of traffic.

TYPICAL PCMS DISPLAY:

With speed reduction:
Message 1: WORKERS PRESENT AHEAD
Message 2: SPEED REDUCED NEXT XXMI

Without speed reduction:
Message 1: WORKERS PRESENT AHEAD
Message 2: NEXT XX MILES

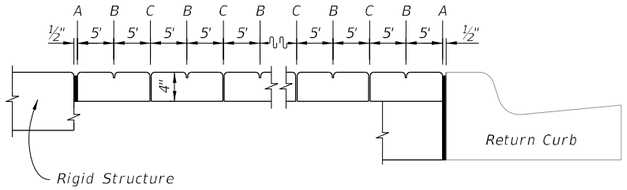
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LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2022-23 STANDARD PLANS	MULTILANE ROADWAY, LANE CLOSURES	INDEX	SHEET
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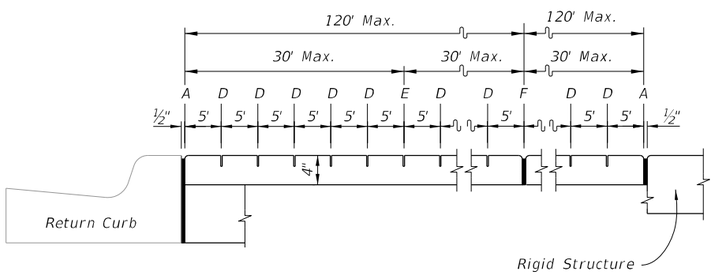
Approved
2023-H-798-00197
James A. Meyer
11/6/2023

GENERAL NOTES:

1. Construct sidewalks in accordance with Specification 522. Use 6" concrete for Sidewalks and Curb Ramps Located within Curb Returns (See Plan View). Install all other concrete with thickness as shown, unless otherwise detailed in the Plans.
2. Include detectable warnings on sidewalk curb ramps in accordance with Index 522-002.
3. For Driveways see Index 522-003.
4. Bond breaker material can be any impermeable coated or sheet membrane or preformed material having a thickness of not less than 6 mils and not more than ½".
5. Construct sidewalks with Edge Beam through the limits of any surface mounted Pedestrian/Bicycle Railing or Pipe Guiderail shown in the plans. (See RAILING DETAIL)



OPEN JOINTS



SAWED JOINTS

LONGITUDINAL SECTION

LEGEND:

A- ½" Expansion Joints (Preformed Joint Filler) between the sidewalk and; driveways, sidewalk-intersections, and all other fixed objects (e.g. drainage inlets and utility poles).

B- ⅛" Dummy Joints, Tooled

C- ⅛" Formed Open Joints

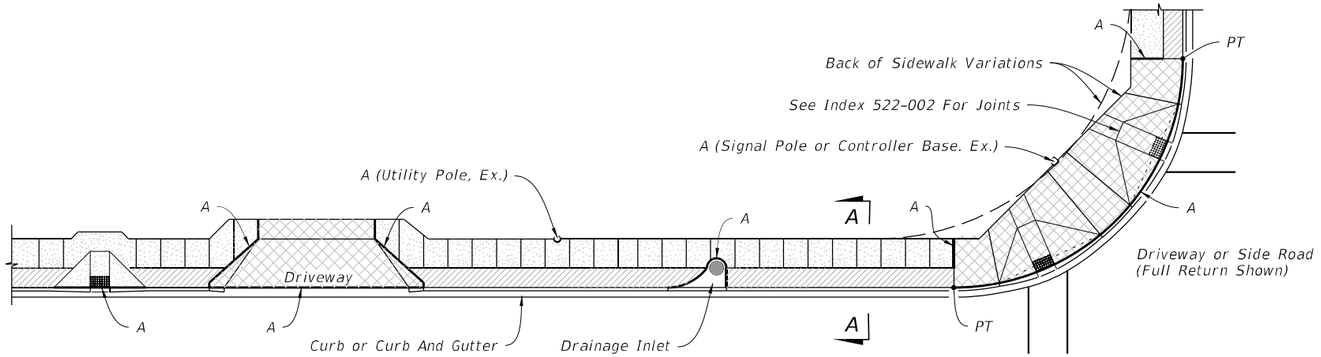
D- 3/16" Saw Cut Joints, 1½" Deep (within 96 hours) Max. 5' Centers

E- 3/16" Saw Cut Joints, 1½" Deep (within 12 hours) Max. 30' Centers Joint(s) Required When Length Exceeds 30'

F- ½" Expansion Joint When Run Of Sidewalk Exceeds 120'. Intermediate locations when called for in the plans or at locations as directed by the Engineer.

G- Cold Joint With Bond Breaker, Tooled

SIDEWALK JOINTS

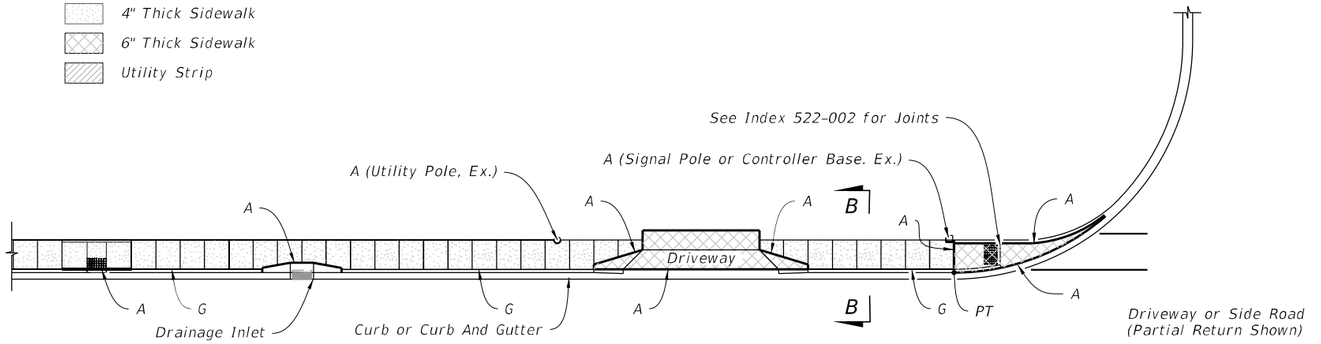


PLAN

SIDEWALK WITH UTILITY STRIP

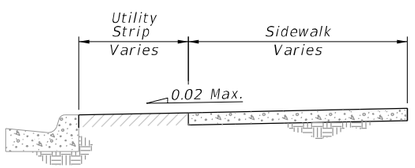
LEGEND:

- 4" Thick Sidewalk
- 6" Thick Sidewalk
- Utility Strip

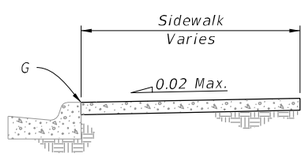


PLAN

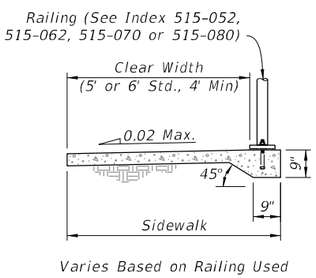
SIDEWALK WITHOUT UTILITY STRIP



SECTION A-A



SECTION B-B



Varies Based on Railing Used

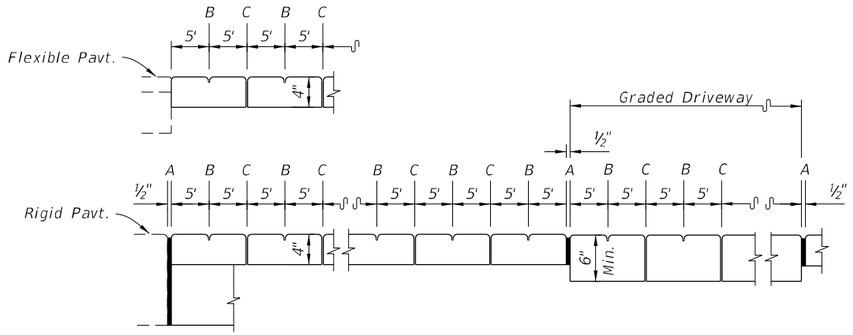
RAILING DETAIL

GENERAL NOTES AND CONCRETE SIDEWALK ON CURBED ROADWAYS

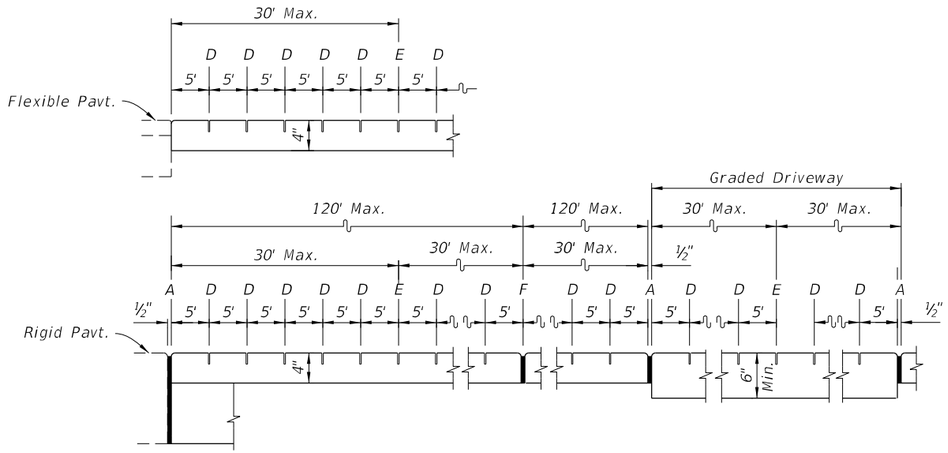
LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2022-23 STANDARD PLANS	CONCRETE SIDEWALK	INDEX	SHEET
11/01/18					522-001	1 of 2

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Approved
2023.11.06 10:30:19 -05'00'
James A. Meyer
11/6/2023



OPEN JOINTS



SAWED JOINTS

LONGITUDINAL SECTION

LEGEND:

A– ½" Expansion Joints (Preformed Joint Filler) between the sidewalk and driveways, sidewalk-intersections, and all other fixed objects (e.g. drainage inlets and utility poles).

B– ⅛" Dummy Joints, Tooled

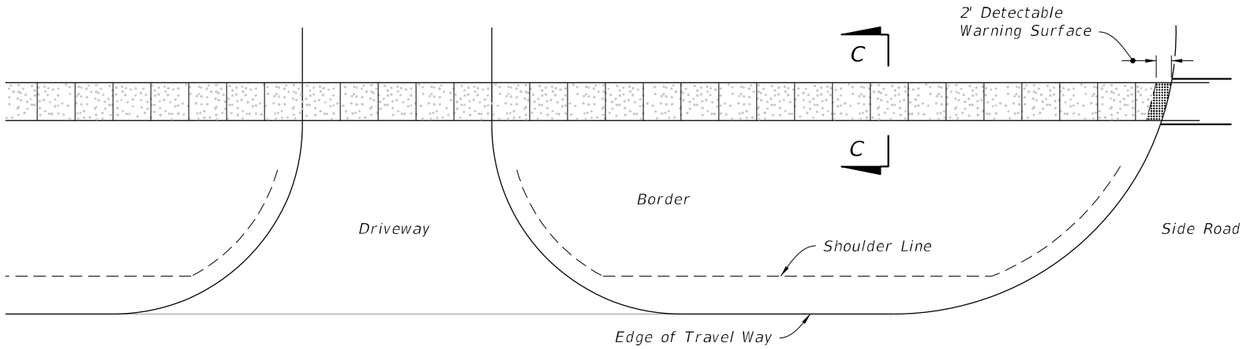
C– ⅛" Formed Open Joints

D– 3/16" Saw Cut Joints, 1½" Deep (within 96 hours) Max. 5' Centers

E– 3/16" Saw Cut Joints, 1½" Deep (within 12 hours) Max. 30' Centers
Joint(s) Required When Length Exceeds 30'

F– ½" Expansion Joint When Run Of Sidewalk Exceeds 120'. Intermediate locations when called for in the plans or at locations as directed by the Engineer.

SIDEWALK JOINTS

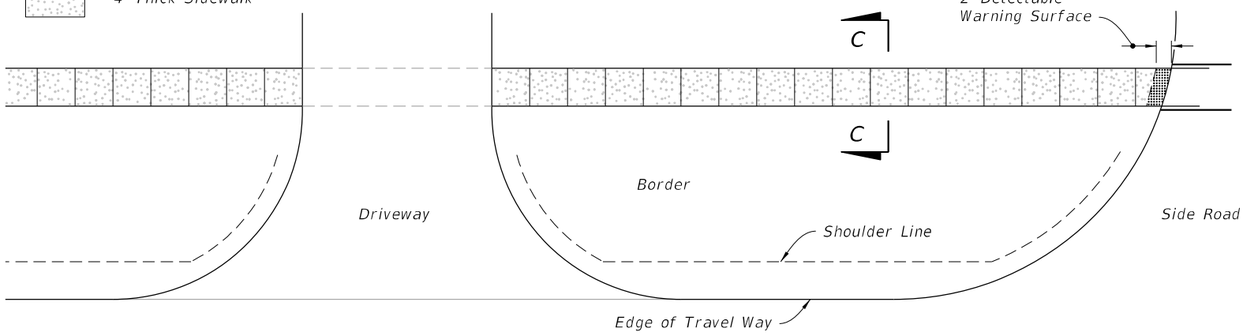


PLAN

CONTINUOUS SIDEWALK

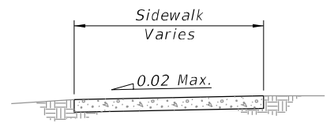
LEGEND:

4" Thick Sidewalk



PLAN

DISCONTINUOUS SIDEWALK



SECTION C-C

CONCRETE SIDEWALK ON FLUSH SHOULDER ROADWAYS

Approved
2023-H798-00197
James A. Meyer
11/6/2023

LAST REVISION	REVISION	DESCRIPTION:			INDEX	SHEET
11/01/18			FY 2022-23 STANDARD PLANS	CONCRETE SIDEWALK	522-001	2 of 2

9/22/2021 8:49:07 AM

GENERAL NOTES:

1. Cross Slopes and Grades:

   A. Sidewalk, ramp, and landing slopes (i.e. 0.02, 0.05, and 1:12) shown in this Index are maximums. With approval of the Engineer, provide the minimum feasible slope where the requirements cannot be met.

   B. Landings must have cross-slopes less than or equal to 0.02 in any direction.

   C. Maintain a single longitudinal slope along each side of the curb ramp. Ramp slopes are not required to exceed 15 feet in length.

   D. Joints permitted at the location of Slope Breaks. Otherwise locate joints in accordance with Index 522-001. No joints are permitted within the ramp portion of the Curb Ramp.

2. Curb, Curb and Gutter and/or Sidewalk:

   A. Refer to Index 522-001 for concrete thickness and sidewalk details.

   B. Remove any existing curb, curb and gutter, or sidewalk to the nearest joint beyond the curb transition or to the extent that no remaining section is less than 5 feet long.

   C. Width of Curb Ramp is 4'-0" minimum. Match sidewalk or Shared Use Path width as shown in the Plans.

3. Curb Ramp Alpha-Identification:

   A. Sidewalk curb ramp alpha-identifications (e.g. CR-A) are provided for reference purposes in the Plans.

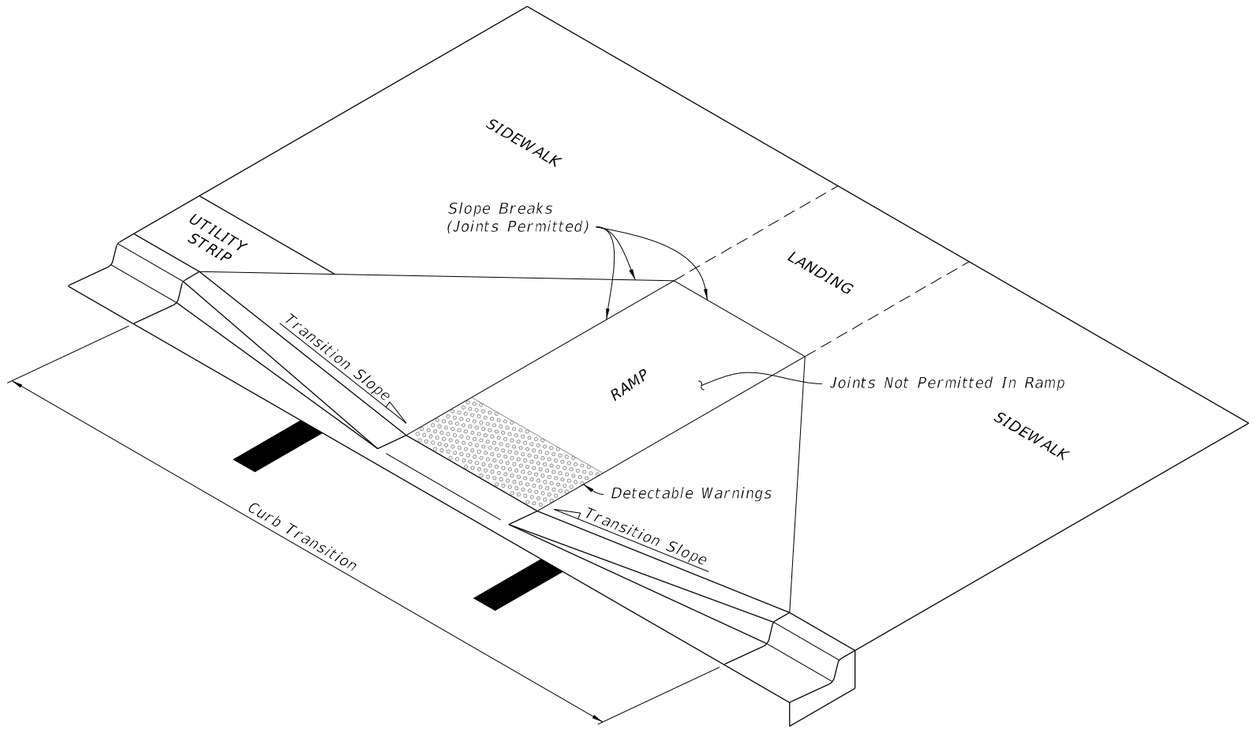
   B. Alpha-identifications CR-I and CR-J are intentionally omitted.

4. Detectable Warnings:

   A. Install detectable warnings in accordance with Specification 527.

   B. Place detectable warnings across the full width of the ramp or landing, to a minimum depth of 2 feet measured perpendicular to the curb line and no greater than 5 feet from the back of the curb or edge of pavement.

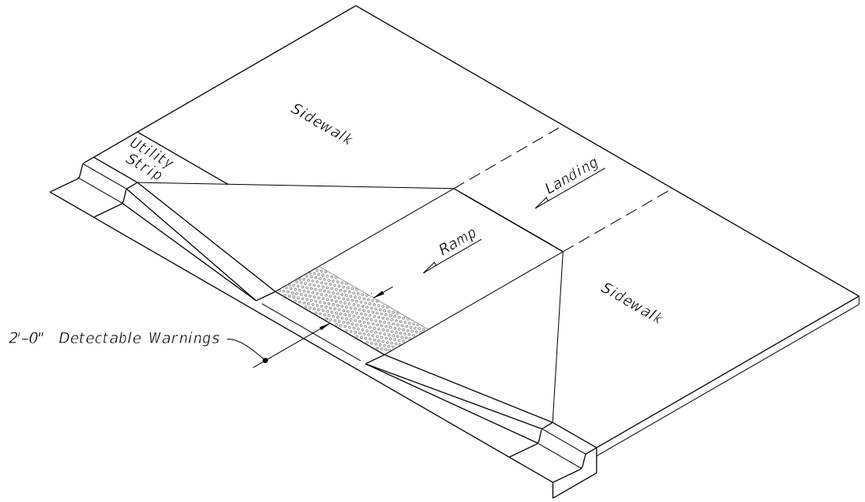
   C. If detectable warnings are shown in the Plans on slopes greater than 5%, align the truncated domes with the centerline of the ramp; otherwise, the truncated domes are not required to be aligned.



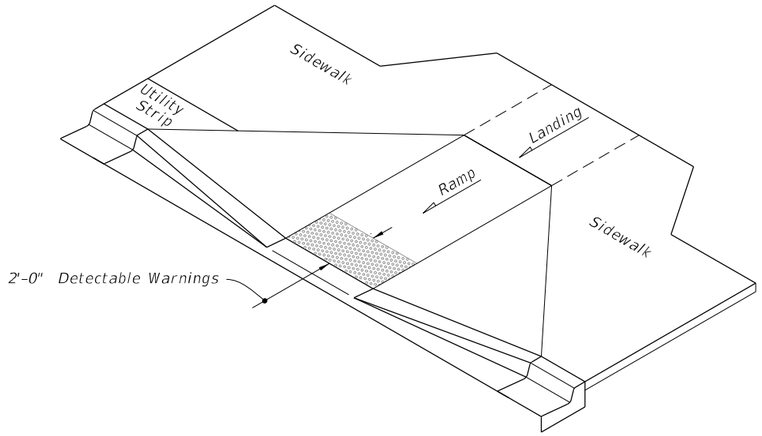
CURB RAMP NOMENCLATURE

9/22/2021 8:50:28 AM

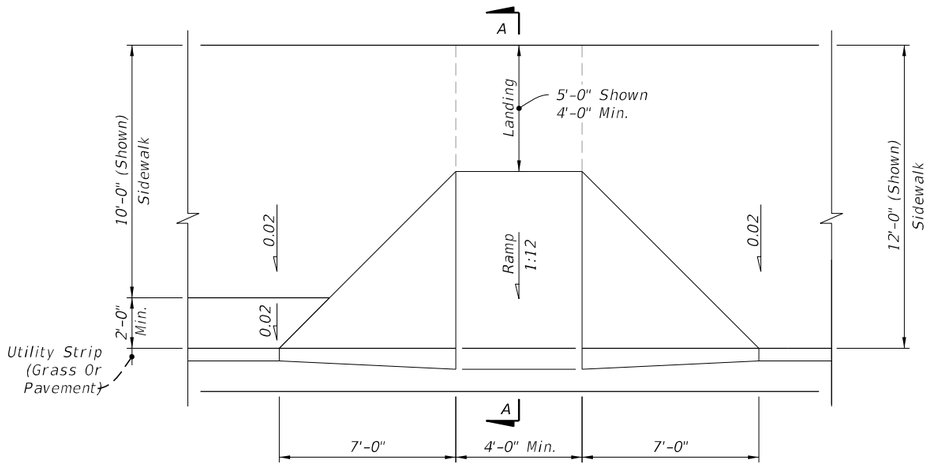
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James A. Meyer
11/6/2023



ISOMETRIC VIEW



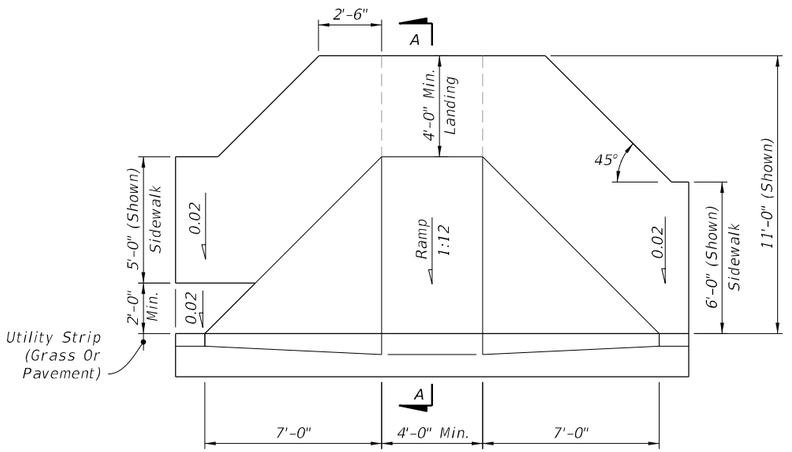
ISOMETRIC VIEW



PLAN VIEW

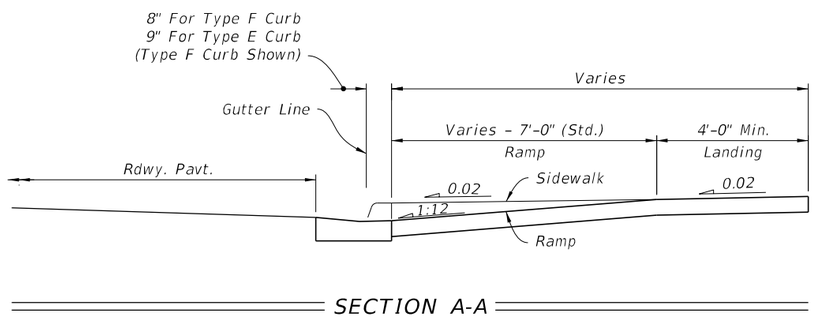
NOTE: For Example of CR-A used in Radial Curb Returns, See Sheet 8.

CR-A



PLAN VIEW

CR-B



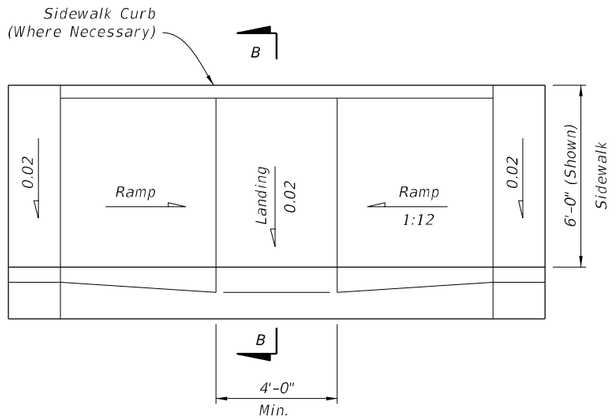
SECTION A-A

SIDEWALK CURB RAMPS CR-A AND CR-B

Approved
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11/6/2023

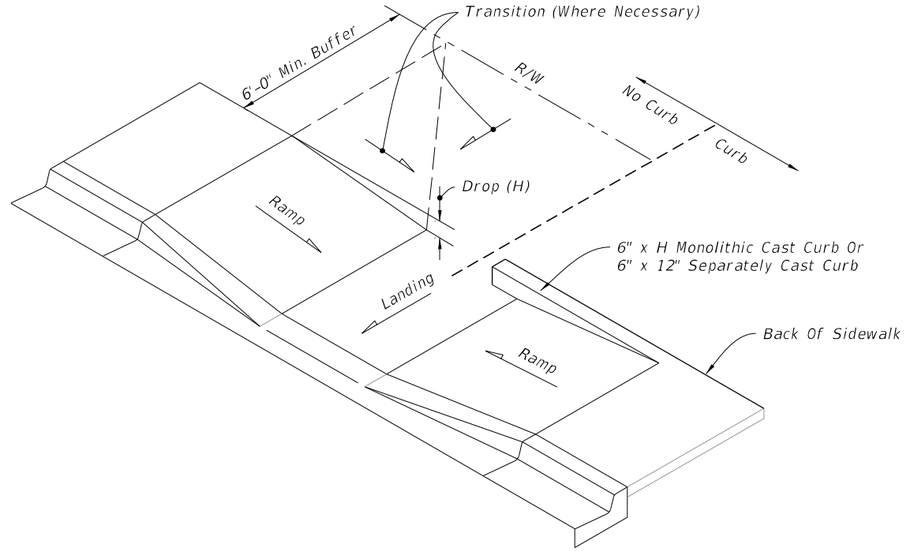
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LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX	SHEET
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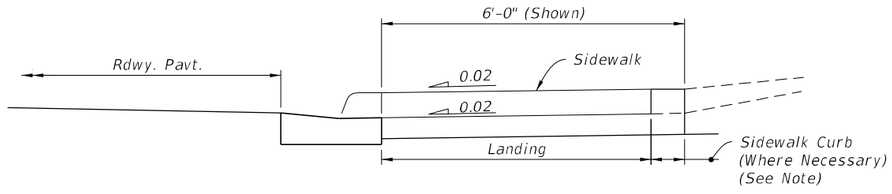


PLAN VIEW

CR-C

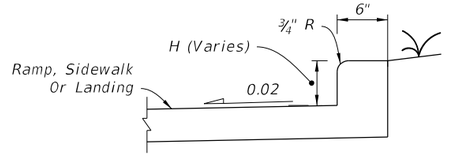


CONSTRUCTION OF SIDEWALK CURB IN CUT SECTIONS

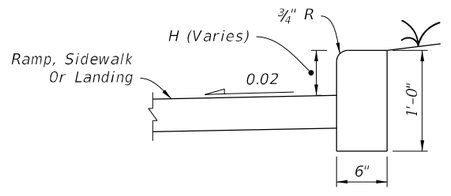


NOTE: For additional information on sidewalk curb construction, see SIDEWALK CURB OPTIONS details.

SECTION B-B



MONOLITHIC CAST CURB



SEPARATELY CAST CURB

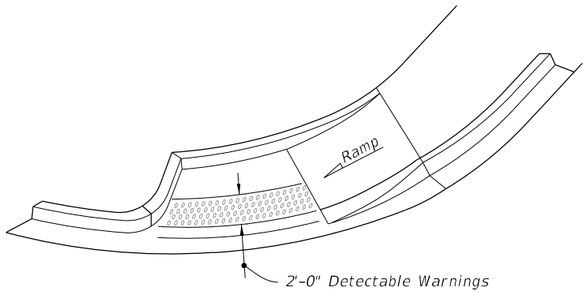
SIDEWALK CURB OPTIONS

9/22/2021 8:50:34 AM

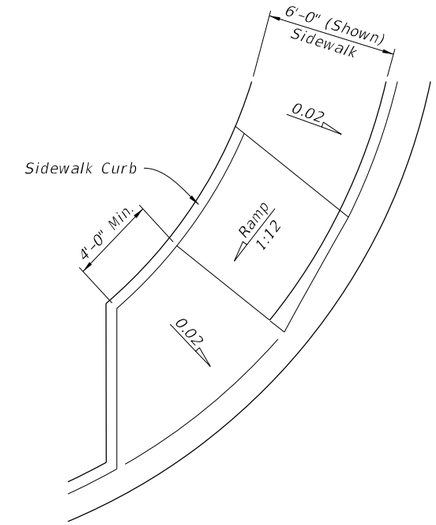
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11/6/2023

SIDEWALK CURB RAMPS CR-C AND SIDEWALK CURB

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2022-23 STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX	SHEET
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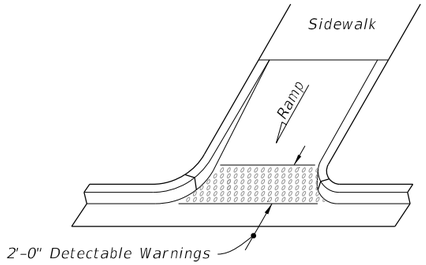


ISOMETRIC VIEW

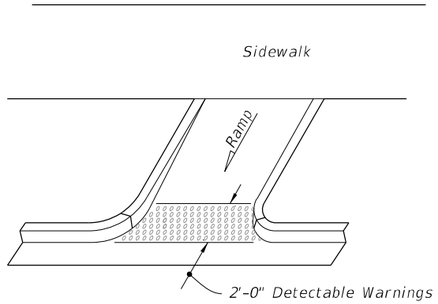


PLAN VIEW

CR-D

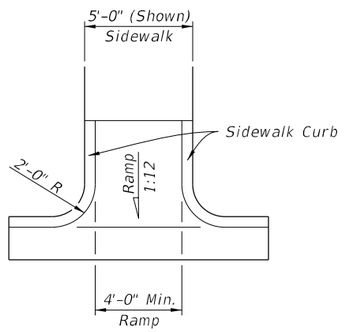


OPTION A



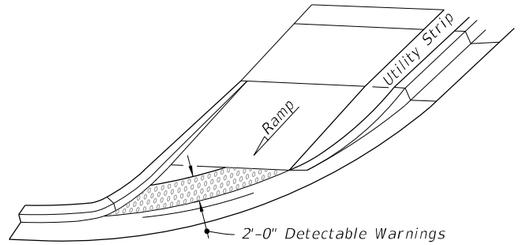
OPTION B

ISOMETRIC VIEW

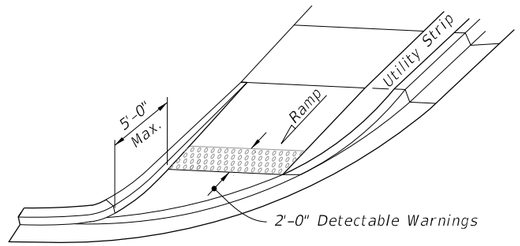


PLAN VIEW

CR-E

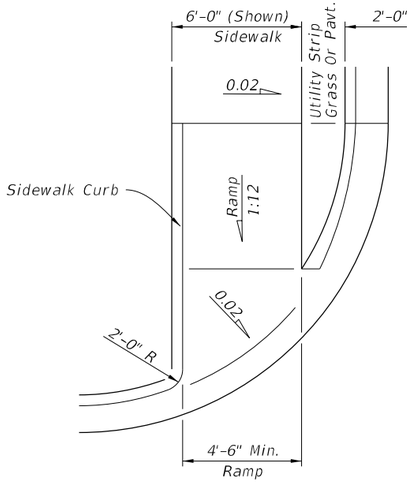


OPTION A



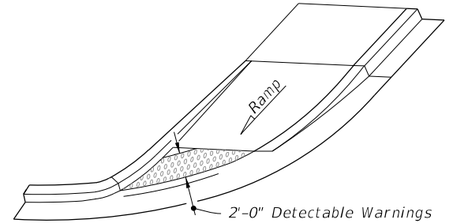
OPTION B

ISOMETRIC VIEW

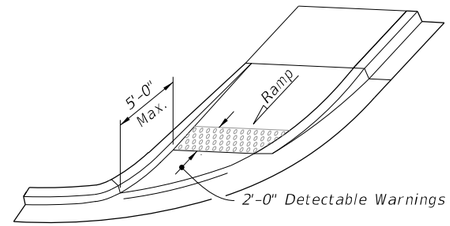


PLAN VIEW

CR-F

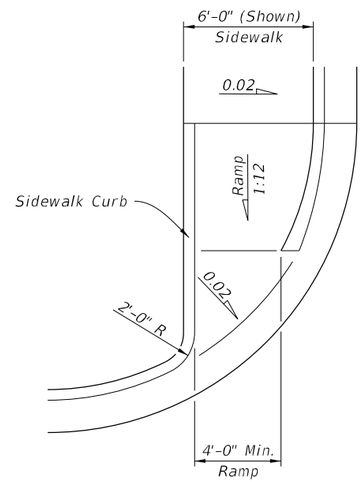


OPTION A



OPTION B

ISOMETRIC VIEW



PLAN VIEW

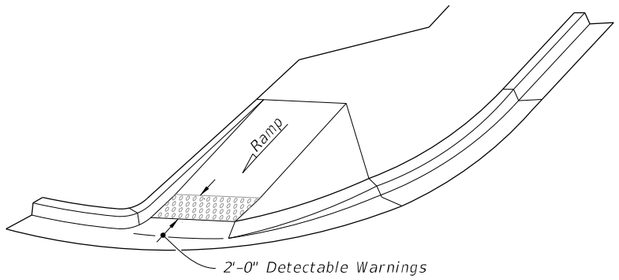
CR-G

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2023-H-798-00197
James A. Meyer
11/6/2023

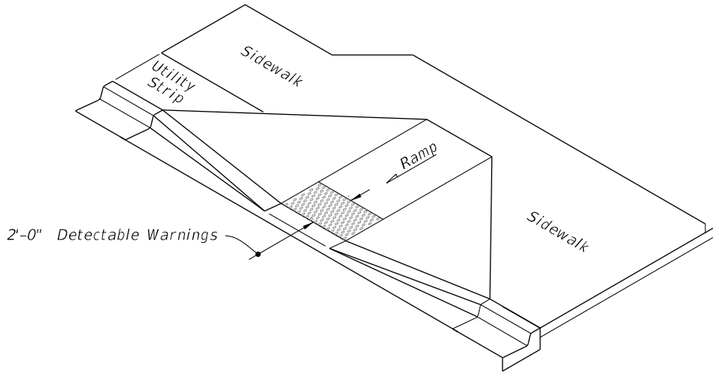
SIDEWALK CURB RAMPS CR-D, CR-E, CR-F & CR-G

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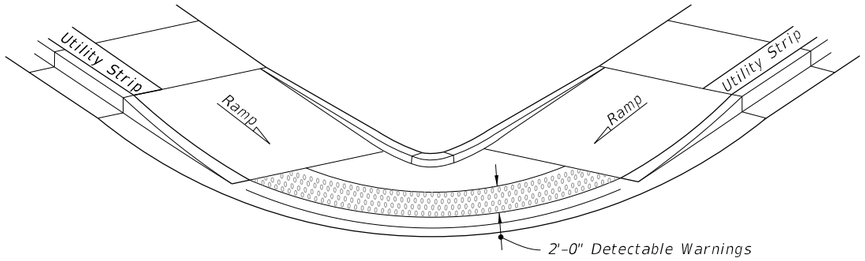
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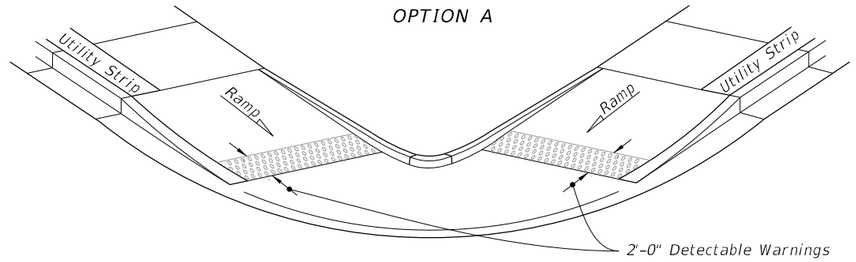
ISOMETRIC VIEW



ISOMETRIC VIEW

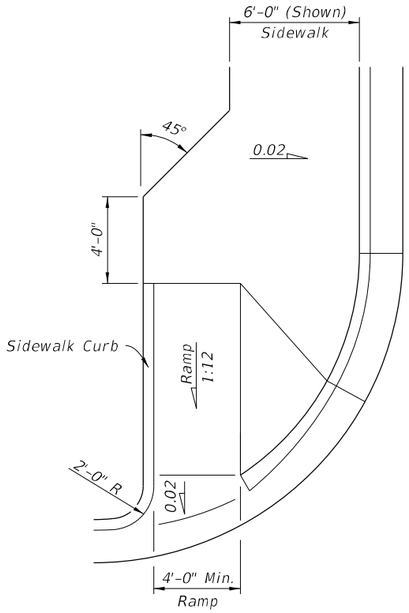


OPTION A



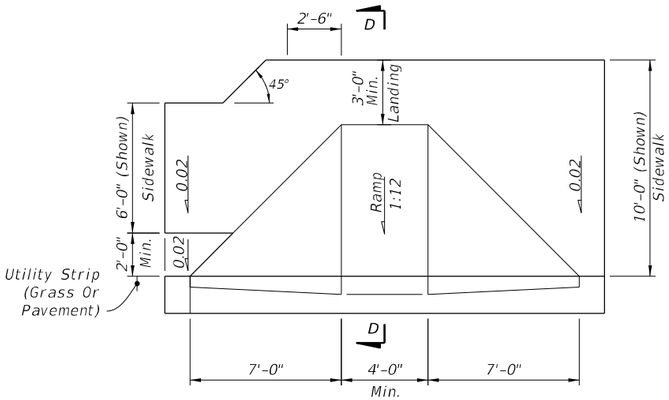
OPTION B

ISOMETRIC VIEW



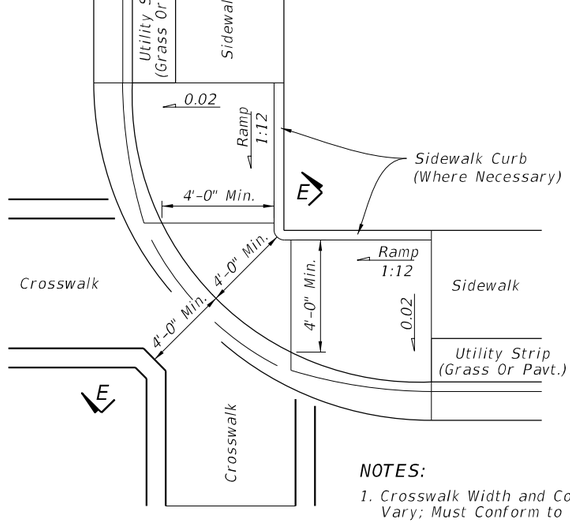
PLAN VIEW

CR-H



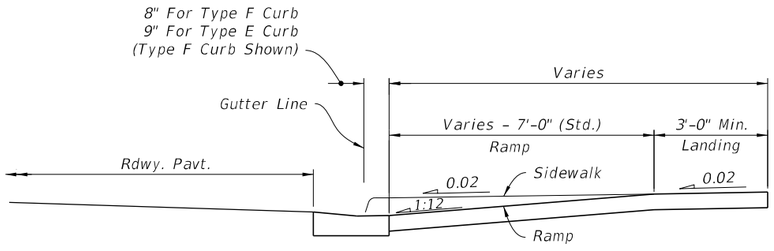
PLAN VIEW

CR-K

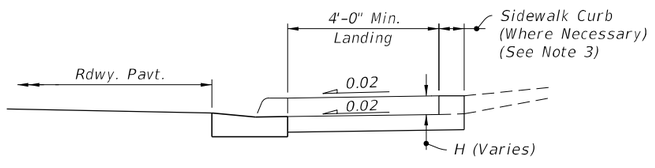


PLAN VIEW

CR-L



SECTION D-D



SECTION E-E

NOTES:

1. Crosswalk Width and Configuration Vary; Must Conform to Index 711-001.
2. 15' Radius Curve Shown for CR-L.
3. For additional information on sidewalk curb construction, see SIDEWALK CURB OPTIONS details, on Sheet 3.

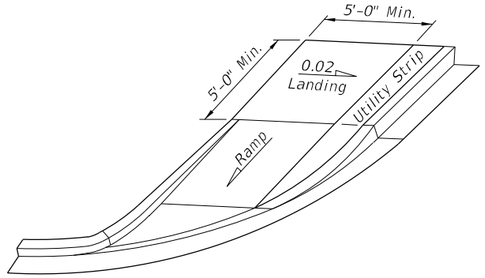
SIDEWALK CURB RAMPS CR-H, CR-K & CR-L

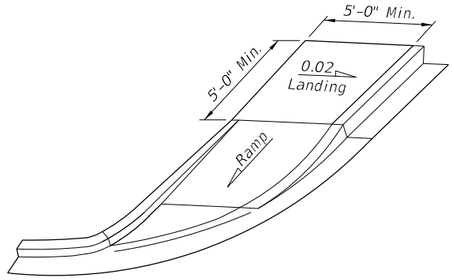
Approved
2023-H798-00197
James A. Meyer
11/6/2023

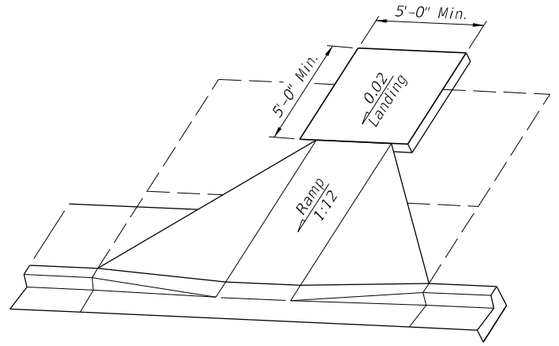
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9/22/2021

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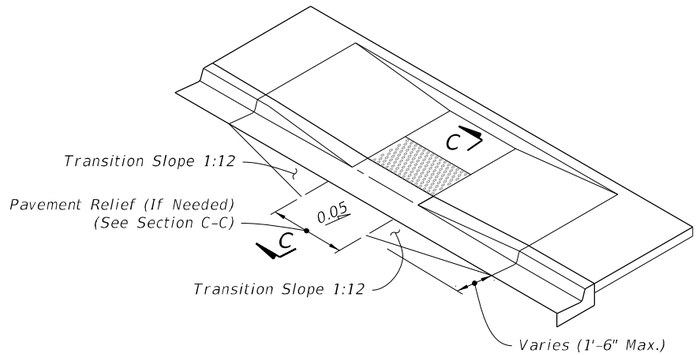






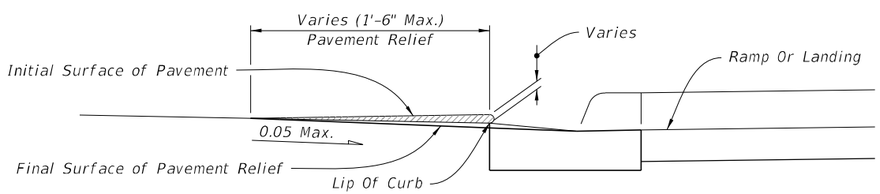
LANDINGS FOR CURB RAMPS WITHOUT SIDEWALKS

(See CR-F, CR-G & CR-K Respectively For Detectable Warning Details/Options)



ISOMETRIC VIEW

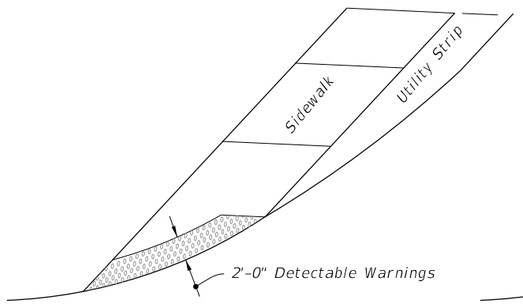
(CR-C Shown, Other Similar)



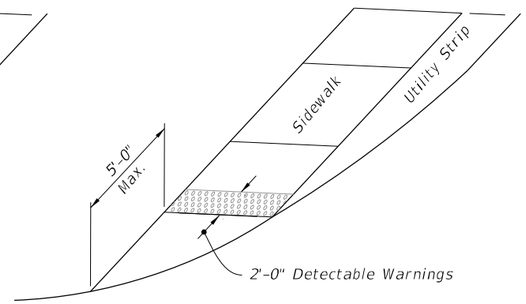
NOTE: *Remove Elevated Pavement By Spading And Rolling, Smooth Milling, or Grinding.*

SECTION C-C

PAVEMENT RELIEF DETAILS



OPTION A



OPTION B

DETECTABLE WARNING ON FLUSH SHOULDER SIDEWALKS

8:50:40 AM

9/22/2021

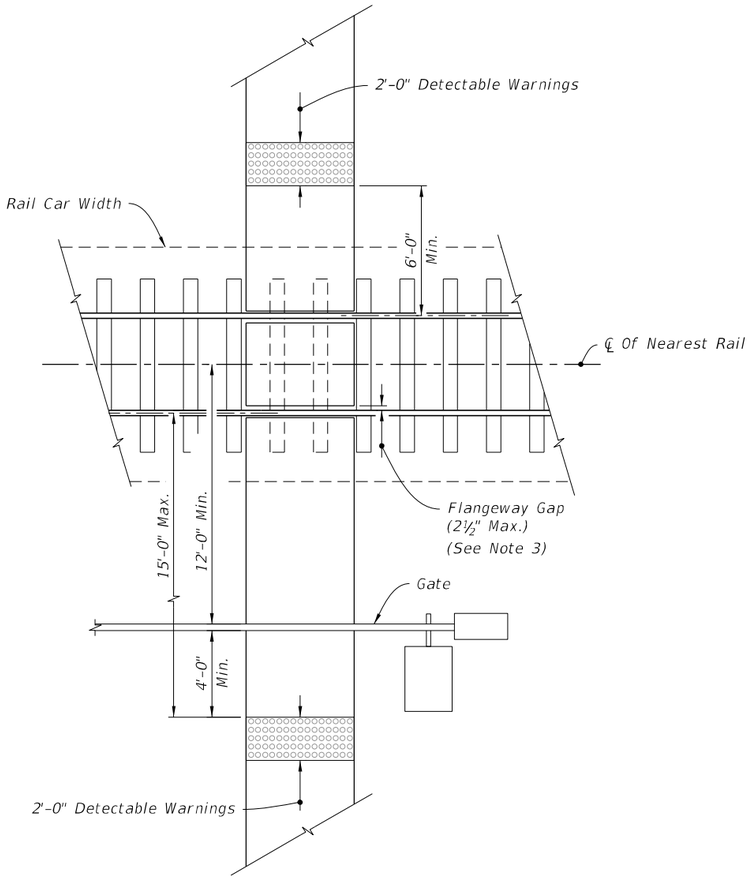
Approved
2023-H 798-00197
James A. Meyer
11/6/2023

CURB RAMPS WITHOUT SIDEWALKS AND FLUSH SHOULDER SIDEWALKS

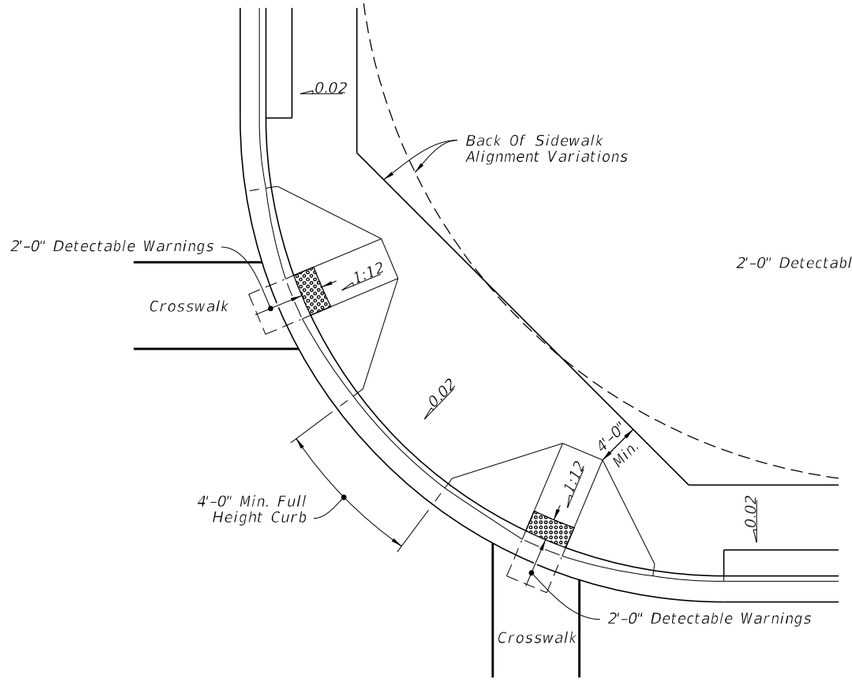
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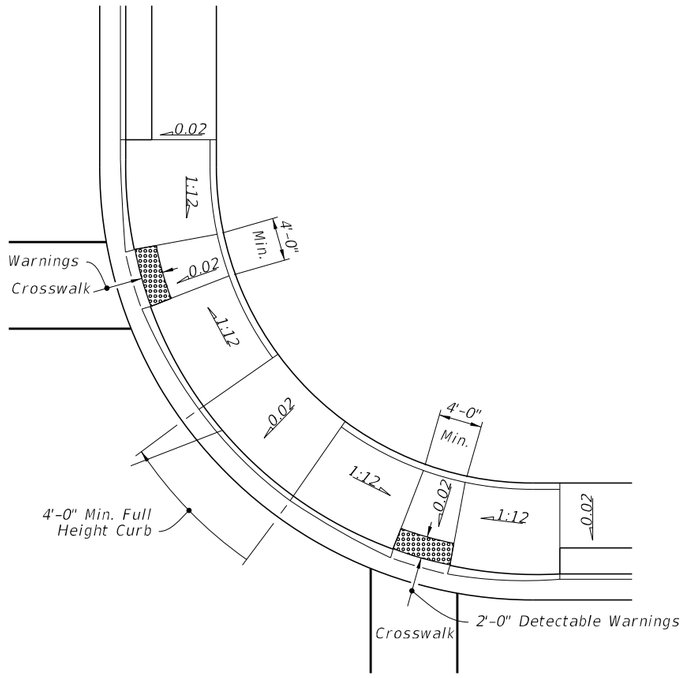
NOTES:

1. Where crosswalk markings are used, ramps must fall within the crosswalk limits. A clear space of 48" minimum is required at the bottom of the ramp within a marked crosswalk. If crosswalk markings are not present, a clear space of 48" minimum is required at the bottom of the ramp outside of active travel lanes.
2. Crosswalk widths and configurations vary; must conform to Index 711-001.
3. Flangeway Gap may be up to 3" for Freight-only Railways.

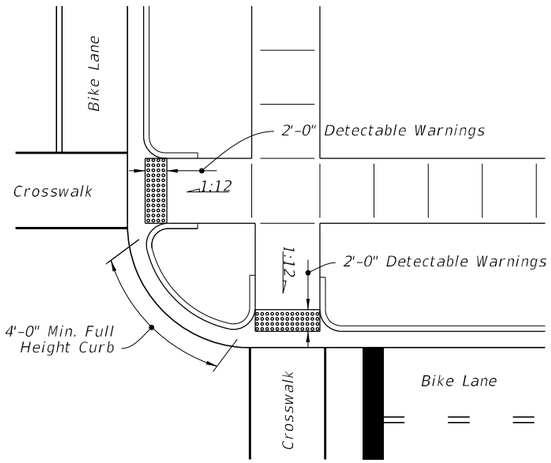


RAILROAD CROSSING

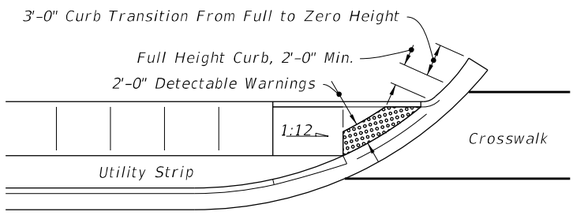




CURB RAMPS WITHIN RADIAL RETURN



CURB RAMPS OUTSIDE RADIAL RETURN



LINEAR SIDEWALK RAMPS

PLACEMENT OF SIDEWALK CURB RAMPS AT CURBED RETURNS (TYP.)

Approved
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James A. Meyer
11/6/2023

RAILROAD CROSSING AND CURB RAMPS AT CURBED RETURNS

LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	DETECTABLE WARNINGS AND SIDEWALK CURB RAMPS	INDEX	SHEET
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9/22/2021 8:50:43 AM

NOTE:

1. This Index applies to Two-Lane, Two-Way and Multilane Roadways, including Medians of divided roadways, with work on the shoulder.

2. L = Taper Length
   X = Work Zone Sign Spacing
   B = Buffer Length
   See Index 102-600 for "L", "X", "B", and channelizing device spacing values.

3. Where work activities are between 2' and 15' from the edge of traveled way, the Engineer may omit signs and channelizing devices for work operations 60 minutes or less.

4. When four or more work vehicles enter the through traffic lanes in a one hour period (excluding establishing and terminating the work area), use a flagger or lane closure to accommodate work vehicle ingress and egress.

5. For work less than 2' from the traveled way and work zone speed is greater than 45 MPH, use a lane closure.

6. The "Speeding Fines Doubled When Workers Present" signs (MOT-13-06) and "End Road Work" Signs (G20-2) along with the associated work zone sign spacing distances may be omitted when the work operation is in place for 24 hours or less.

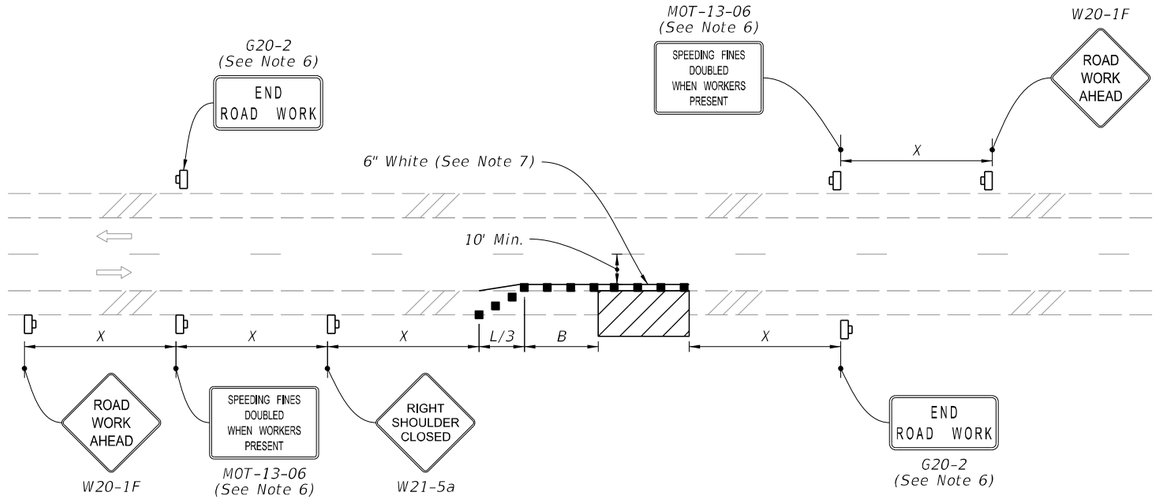
7. Temporary pavement markings may be omitted when the work operation is in place for 3 days or less.

8. Omit "Shoulder Closed" signs (W21-5a) along with associated work zone sign spacing distances for work on the median.

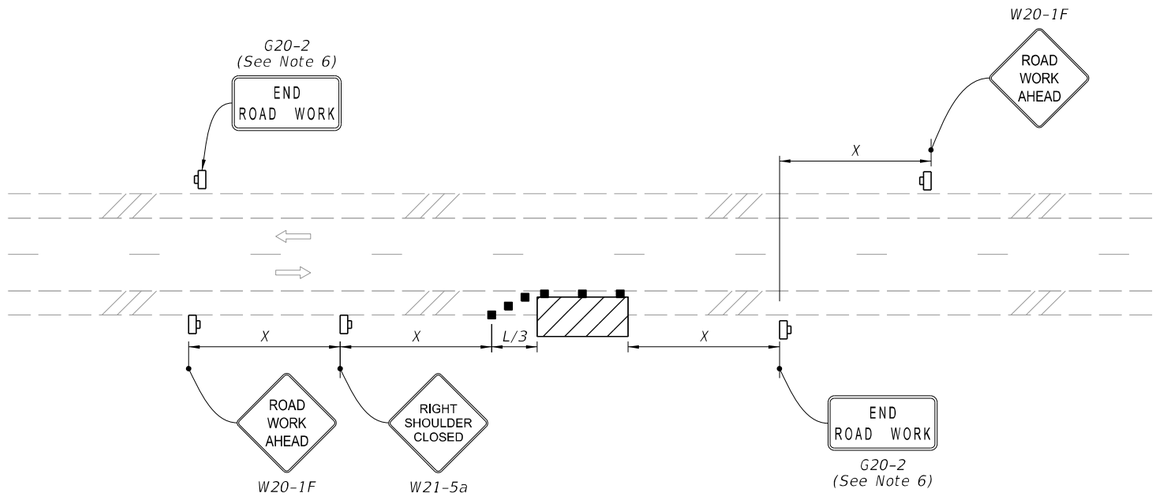
9. When there is no paved shoulder, the "Worker" sign (W21-1) may be used instead of the "Shoulder Closed" sign (W21-5a).

SYMBOLS:

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Lane Identification and Direction of Traffic



TWO-LANE ROADWAY
SHOULDER WORK LESS THAN 2' FROM THE TRAVELED WAY
WITH WORK ZONE SPEED OF 45 MPH OR LESS

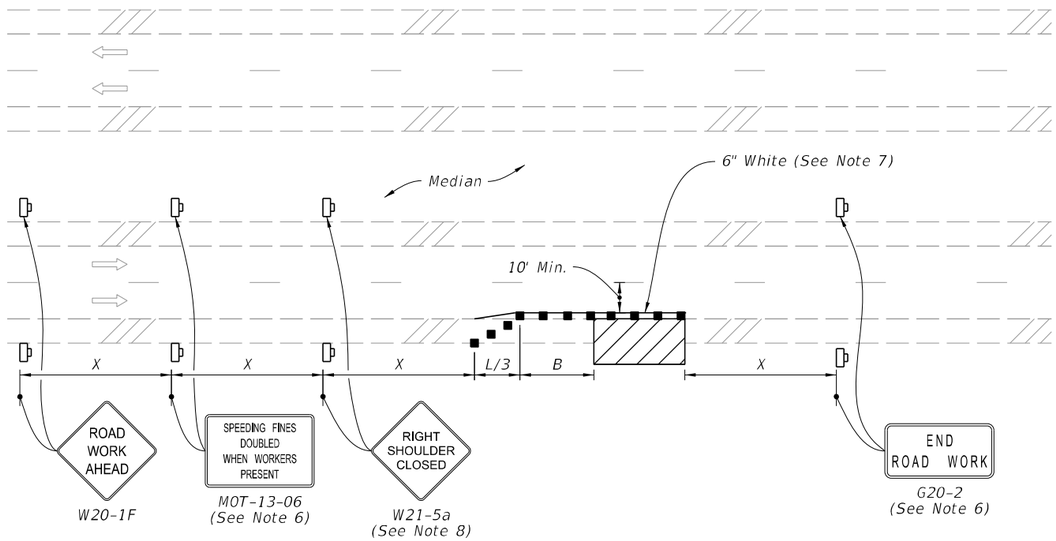


TWO-LANE ROADWAY
SHOULDER WORK BETWEEN 2' AND 15' FROM THE TRAVELED WAY

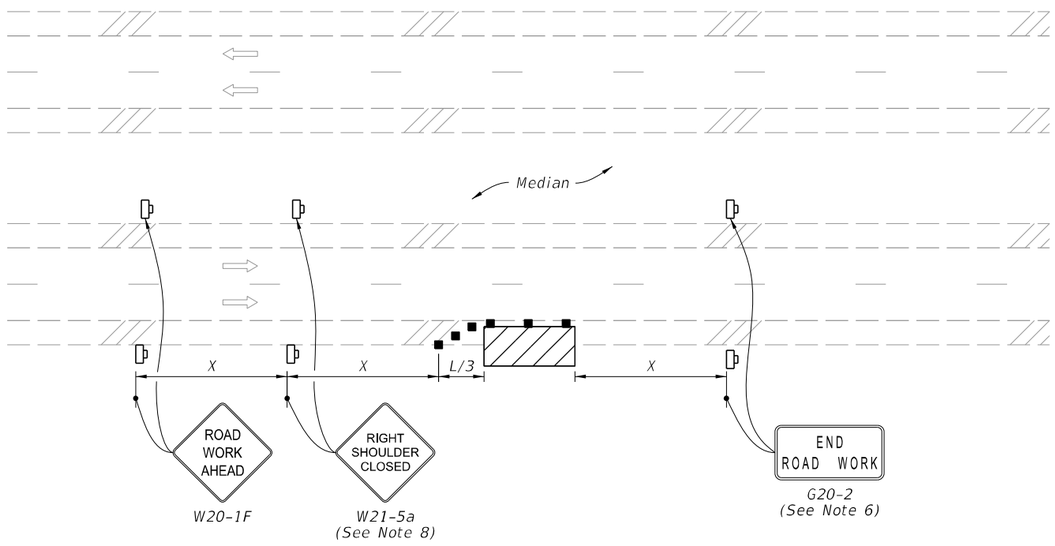
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LAST REVISION	REVISION	DESCRIPTION:	FDOT	FY 2022-23 STANDARD PLANS	TWO-LANE AND MULTILANE, WORK ON SHOULDER	INDEX	SHEET
11/01/21						102-602	1 of 2

Approved
2023-H-798-00197
James A. Meyer
11/6/2023



MULTILANE ROADWAY
SHOULDER WORK LESS THAN 2' FROM THE TRAVELED WAY
WITH WORK ZONE SPEED OF 45 MPH OR LESS



SYMBOLS:

- Work Area
- Channelizing Device (See Index 102-600)
- Work Zone Sign
- Lane Identification and Direction of Traffic

MULTILANE ROADWAY
SHOULDER WORK BETWEEN 2' AND 15' FROM THE TRAVELED WAY

Approved
2023-H-798-00197
James A. Meyer
11/6/2023

9/23/2021 2:40:49 PM

LAST REVISION	REVISION	DESCRIPTION:	FDOT FY 2022-23 STANDARD PLANS	TWO-LANE AND MULTILANE, WORK ON SHOULDER	INDEX	SHEET
11/01/20					102-602	2 of 2

Florida Department of Transportation

Stormwater Pollution Prevention



Background

The National Pollutant Discharge Elimination System (NPDES) is a stormwater permitting program managed by the Florida Department of Environmental Protection (FDEP) which regulates construction activities that disturb one or more acres of land. Projects less than one acre may by regulated if the activity is part of a larger common plan of development or sale that will exceed the one acre threshold. Disturbance includes clearing, grading, and excavating.

The NPDES program also regulates municipal storm sewer systems that serve highways, area roads, and streets in your neighborhood.

Construction Requirements for Regulated Activities

- Prepare and implement a Stormwater Pollution Prevention Plan (SWPPP)
- Obtain and abide by Department of Environmental Protection (DEP) Generic Permit for Construction Activities.

For more information regarding NPDES Generic Permits for Construction Activities, please visit:
http://www.dep.state.fl.us/water/stormwater/npdes/construction1.htm

To apply using the online FDEP Business Portal, please visit:
http://www.fldepportal.com/go/apply-build/

Contacts

To report **illicit discharges**, please contact the appropriate representative listed below:

Citrus County	Citrus County BOCC – Engineering	Primary: 352-527-5446
Hernando County	Hernando County Stormwater	Primary: 352-754-4062
Hillsborough County	Hillsborough County Environmental Protection Commission	Primary: 813-627-2600 Alternate: 813-744-5671
Pasco County	Pasco County Stormwater	Primary: 727-834-3611
Pinellas County	Pinellas County Environmental Management	Primary: 727-464-4187 Alternate: 727-464-4703
FDOT Right-of-Way	District Maintenance	Primary: 813-975-6639

Environmental Protection Agency (EPA) **Spill Response Hotline: 1-800-424-8802**
For EPA spill and environmental violation information, please visit:
https://www.epa.gov/pesticide-incidents/report-spills-and-environmental-violations

Preventing Illicit Discharges & Water Pollution

Illicit Discharges are point sources of discharge which negatively impact stormwater, which eventually drains into local natural water systems. The most effective way to eliminate these discharges is to dispose of pollutants correctly. Below are common examples:

- Yard clippings & leaves
- Fertilizers and herbicides
- Pet waste
- Trash
- Used motor oil / filters
- Antifreeze/transmission fluid
- Paint
- Solvent / degreaser
- Cooking Grease





For more information on the proper disposal of wastes contact FDEP at 813-470-5700

Approved
2023H-98-00197
James A. Meyer
11/6/2023

FDEP (Water) Permit

FLORIDA DEPARTMENT OF
Environmental Protection

Southwest District Office
13051 North Telecom Parkway #101
Temple Terrace, Florida 33637-0926

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

Notification of Acceptance of Use of a General Permit

PERMITTEE:
John Bostic III, Utilities Director
City of Zephyrhills
5335 8th Street
Zephyrhills, FL 33542
jbostic@ci.zephyrhills.fl.us

Permit Number: 0082640-166-DSGP/02
Issue Date: October 18, 2023
Expiration Date: October 17, 2028
County: Pasco
Project Name: South 301 W Water and Wastewater Pipelines
Water Supplier: City of Zephyrhills
PWS ID: 651-2020

Dear Mr. Bostic:

On September 27, 2023, the Florida Department of Environmental Protection received a "*Notice of Intent to Use the General Permit for Construction of Water Main Extensions for PWSs*" [DEP Form No. 62-555.900(7)], under the provisions of Rule 62-4.530 and Chapter 62-555, Florida Administrative Code (F.A.C.). The proposed project includes the construction of approximately: 2,800 linear feet of eight-inch diameter water main pipe(s). The project is located on Gall Boulevard between Alston Avenue and Tucker Road.

Based upon the submitted Notice and accompanying documentation, this correspondence is being sent to advise that the Department does not object to the use of such general permit at this time. Please be advised that the permittee is required to abide by Rule 62-555.405, F.A.C., all applicable rules in Chapters 62-4, 62-550, 62-555, F.A.C., and the General Conditions for All General Drinking Water Permits (found in 62-4.540, F.A.C.).

All construction must be in accordance with this permit. Before commencing work on project changes for which a construction permit modification is required per 62-555.536(1), the permittee shall submit to the Department a written request for a permit modification. Each such request shall be accompanied by one copy of a revised construction permit application, the proper processing fee and one copy of either a revised preliminary design report or revised drawings, specifications and design data.

The permittee shall comply with all sampling requirements specific to this project. These requirements are attached for review and implementation.

Pursuant to Rule 62-555.345, F.A.C., the permittee shall submit a certification of construction completion [DEP Form No. 62-555.900(9)] to the Department and obtain approval, or clearance, from the Department before placing any water main extension constructed under this general permit into operation for any purpose other than disinfection or testing for leaks.

Within 30 days after the sale or legal transfer of ownership of the permitted project that has not been cleared for service in total by the Department, both the permittee and the proposed permittee shall sign and submit an application for transfer of the permit using Form 62-555.900(8), F.A.C., with the appropriate fee. The permitted construction is not authorized past the 30-day period unless the permit has been transferred.

This permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project, per Rule 62-4.030, F.A.C.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

for Shannon Herbon
Program Administrator
Permitting & Waste Cleanup Program
Southwest District

Enclosures: Clearance Requirements/Utilities Separation Requirements

cc:
Kenneth A. Fraser, PE, Jones Edmunds, KFraser@jonesedmunds.com
Marisol Alvarez, E.I., Jones Edmunds, MAlvarez@jonesedmunds.Com
K. Virgilio, Jones Edmunds, kvirgilio@jonesedmunds.com
Belinda Oliver, DEP SWD, belinda.oliver@floridadep.gov

A Civil Penalty May Be Incurred

if this project is placed into operation before obtaining a clearance from this office.

Requirements for clearance upon completion of projects are as follows:

1) **Clearance Form**
Submission of a fully completed Department of Environmental Protection (DEP) Form 62-555.900(9) *Certification of Construction Completion and Request for Clearance to Place Permitted PWS Components into Operation*.

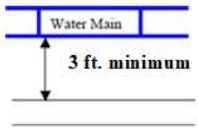
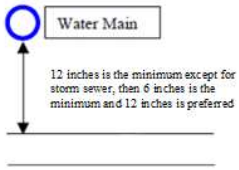
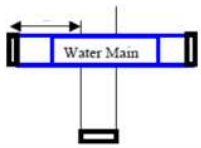
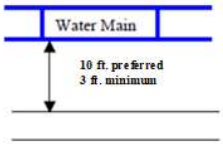
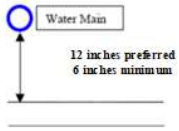
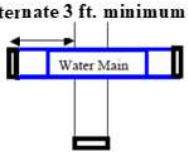
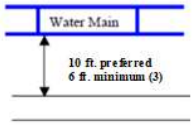
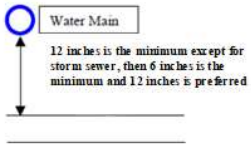
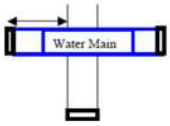
2) **Record Drawings, if deviations were made**
Submission of the portion of record drawings showing deviations from the DEP construction permit, including preliminary design report or drawings and specifications, if there are any deviations from said permit (Note that it is necessary to submit a copy of only the portion of record drawings showing deviations and not a complete set of record drawings.).

3) **Bacteriological Results**
Copies of satisfactory bacteriological analysis (a.k.a. Main Clearance), taken within sixty (60) days of completion of construction, from locations within the distribution system or water main extension to be cleared, in accordance with Rules 62-555.315(6), 62-555.320(12)(d), 62-555.350(6), 62-555.340, and 62-555.330, F.A.C. and American Water Works Association (AWWA) Standard C 651-92, as follows:

- Connection to existing system
- The end point of the proposed addition
- Any water lines branching off a main extension
- Every 1,200 feet on straight runs of pipe

Each location shall be sampled on two consecutive days, at least 6 hours apart, with sample points and chlorine residual readings clearly indicated on the report. A sketch or description of all bacteriological sampling locations must also be provided.

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH RULE 62-555.314, F.A.C.

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)			Alternate 3 ft. minimum 
Vacuum Sanitary Sewer			Alternate 3 ft. minimum 
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)			Alternate 6 ft. minimum 
On-Site Sewage Treatment & Disposal System	10 ft. minimum	---	---

(1) Water main should cross over other pipe. When water main must be below other pipe, the minimum separation is 12 inches.

(2) Reclaimed water regulated under Part III of Chapter 62-610, F.A.C.

(3) 3 ft. for gravity sanitary sewer where the bottom of the water main is laid at least 6 inches above the top of the gravity sanitary sewer.

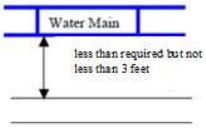
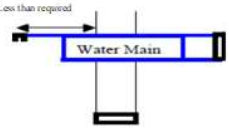
(4) Reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

EXCEPTIONS TO MINIMUM SEPARATION REQUIREMENTS

Where it is not technically feasible or economically sensible to comply with the requirements of 62-555.314(1) or (2), F.A.C., **the Department shall allow exceptions to these requirements if suppliers of water or construction permit applicants provide technical or economic justification for each exception and provide alternative construction features that afford a similar level of reliability and public health protection**.

Acceptable alternative construction features include the following:

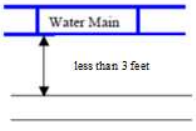
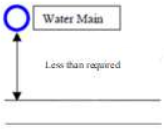
LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(a), F.A.C.

Other Pipe	Horizontal Separation	Joint Spacing @Crossings (Full Joint Centered)
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

Where an underground water main is being laid **less than the required minimum horizontal distance** from another pipeline and where an underground water main is **crossing another pipeline and joints in the water main are being located less than the required minimum distance from joints in the other pipeline**:

1. Use of pressure-rated pipe conforming to the American Water Works Association standards incorporated into Rule 62- 555.330, F.A.C., for the other pipeline if it is a gravity- or vacuum-type pipeline;
2. Use of welded, fused, or otherwise restrained joints for either the water main or the other pipeline; **or**
3. Use of watertight casing pipe or concrete encasement at least four inches thick for either the water main or the other pipeline.

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(b), F.A.C.

Other Pipe	Horizontal Separation	Crossings
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

Where an underground water main is being laid **less than three feet horizontally** from another pipeline and where an underground water main is **crossing another pipeline and is being laid less than the required minimum vertical distance from the other pipeline**:
Use of pipe, or casing pipe, having high impact strength (i.e., having an impact strength at least equal to that of 0.25-inch-thick ductile iron pipe) or concrete encasement at least four inches thick for both the water main **and** for the other pipeline if it is new and is conveying wastewater or reclaimed water.

Disclaimer – This document is provided for your convenience only. Please refer to Rule 62-555.314, F.A.C., for additional construction requirements.

FDEP (Wastewater) Permit

FLORIDA DEPARTMENT OF Environmental Protection

Southwest District Office
13051 North Telecom Parkway #101
Temple Terrace, Florida 33637-0926

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

October 12, 2023

PERMITTEE:
John Bostic III, Utilities Director
City of Zephyrhills
5335 8th Street
Zephyrhills, FL 33542
jbostic@ci.zephyrhills.fl.us

PERMIT NUMBER:	CS51-0030492-126-DWC/CG
ISSUE DATE:	October 12, 2023
EXPIRATION DATE:	October 11, 2028
COUNTY:	Pasco
PROJECT NAME:	South 301 W Water and Wastewater Pipelines
WWTF NAME:	City of Zephyrhills Wastewater Treatment Plant
FACILITY ID:	FLA012744

NOTIFICATION OF ACCEPTANCE OF USE OF A GENERAL PERMIT

Dear Mr. Bostic,

This letter acknowledges receipt of your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System for the subject project. Our Office received the Notice on September 27, 2023.

This is to advise you that the Department does not object to your use of this general permit for the construction of approximately: 5,800 linear feet of six-inch diameter force main pipe(s).

Please note the attached requirements apply to your use of this general permit for constructing the proposed domestic wastewater collection/transmission system.

You are further advised that the construction activity must conform to the description contained in your Notification/Application for Constructing a Domestic Wastewater Collection/Transmission System and that any deviation may subject the permittee to enforcement action and possible penalties.

If you have any questions, please contact Kieran Mannering at 813-470-5744 or via email at Kieran.Mannering@FloridaDEP.gov.

Sincerely,

_____

for Shannon Herbon
Program Administrator
Permitting & Waste Cleanup Program
Southwest District

Copies furnished to:
Kenneth Fraser, P.E., Jones Edmunds & Associates Inc., kfraser@jonesedmunds.com
Marisol Alvarez, E.I., Jones Edmunds & Associates Inc., malvarez@jonesedmunds.com
Keyla Virgilio, E.I., Jones Edmunds & Associates Inc., kvirgilio@jonesedmunds.com
Kieran Mannering, DEP SWD, kieran.mannering@floridadep.gov

REQUIREMENTS FOR USE OF THE GENERAL PERMIT FOR DOMESTIC WASTEWATER COLLECTION/TRANSMISSION SYSTEMS:

1. This general permit is subject to the general permit conditions of Rule 62-4.540, F.A.C., as applicable. This rule is available at the Department's Internet site at: https://floridadep.gov/water/water/content/water-resource-management-rules#ww *[62-4.540]*

2. This general permit does not relieve the permittee of the responsibility for obtaining a dredge and fill permit where it is required. *[62-604.600(6)(b)1]*

3. This general permit cannot be revised, except to transfer the permit. *[62-604.600(6)(b)2]*

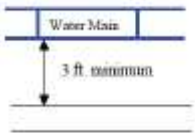
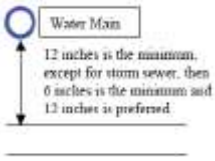
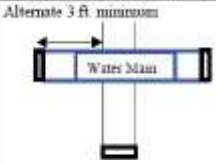
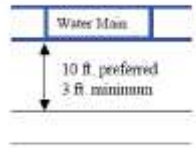
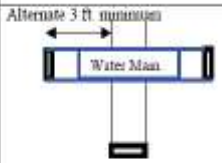
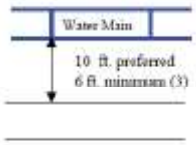
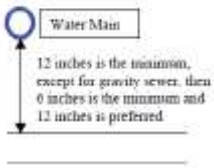
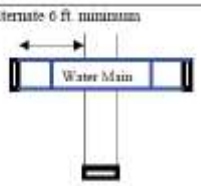
4. This general permit will expire five years from the date of issuance. If the project has been started and not completed by that time, a new permit must be obtained before the expiration date in order to continue work on the project. *[62-4.030]*

5. Upon completion of construction of the collection/transmission system project, and before placing the facilities into operation for any purpose other than testing for leaks or testing equipment operation, the permittee shall submit to the Department's Southwest District Office Form 62-604.300(3)(b), Request for Approval to Place a Domestic Wastewater Collection/Transmission System into Operation. This form is available at the Department's Internet site at: https://floridadep.gov/water/domestic-wastewater/content/domestic-wastewater-forms *[62-604.700(2)]*

6. The new or modified collection/transmission facilities shall not be placed into service until the Department clears the project for use. *[62-604.700(3)]*

7. Abnormal events shall be reported to the Department's Southwest District Office in accordance with Rule 62-604.550, F.A.C. For unauthorized spills of wastewater in excess of 1000 gallons per incident, or where information indicates that public health or the environment may be endangered, oral reports shall be provided to the STATE WATCH OFFICE TOLL FREE NUMBER (800) 320-0519 as soon as practical, but no later than 24 hours from the time the permittee or other designee becomes aware of the circumstances. Unauthorized releases or spills less than 1000 gallons per incident are to be reported orally to the Department's Southwest District Office within 24 hours from the time the permittee, or other designee becomes aware of the circumstances. *[62-604.550]*

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH RULE 62-555.314, F.A.C.

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @ Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)			
Vacuum Sanitary Sewer			
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)			
On-Site Sewage Treatment & Disposal System	10 ft. minimum	---	---

(1) Water main should cross above other pipe. When water main must be below other pipe, the minimum separation is 12 inches.

(2) Reclaimed water regulated under Part III of Chapter 62-610, F.A.C.

(3) 3 ft. for gravity sanitary sewer where the bottom of the water main is laid at least 6 inches above the top of the gravity sanitary sewer.

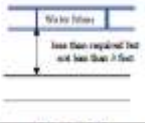
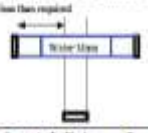
(4) Reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

EXCEPTIONS TO MINIMUM SEPARATION REQUIREMENTS

Where it is not technically feasible or economically sensible to comply with the requirements of 62-555.314(1) or (2), F.A.C., **the Department shall allow exceptions to these requirements if suppliers of water or construction permit applicants provide technical or economic justification for each exception and provide alternative construction features that afford a similar level of reliability and public health protection.**

Acceptable alternative construction features include the following:

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(a), F.A.C.

Other Pipe	Horizontal Separation	Joint Spacing @ Crossings (Full Joint Centered)
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

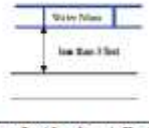
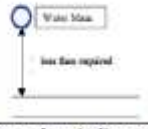
Where an underground water main is being laid **less than the required minimum horizontal distance** from another pipeline and where an underground water main is **crossing another pipeline and joints in the water main are being located less than the required minimum distance from joints in the other pipeline**:

1. Use of pressure-rated pipe conforming to the American Water Works Association standards incorporated into Rule 62-555.330, F.A.C., for the other pipeline if it is a gravity- or vacuum-type pipeline;

2. Use of welded, fused, or otherwise restrained joints for either the water main or the other pipeline; **or**

3. Use of watertight casing pipe or concrete encasement at least four inches thick for either the water main or the other pipeline.

LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH 62-555.314(5)(b), F.A.C.

Other Pipe	Horizontal Separation	Crossings
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water, Vacuum Sanitary Sewer, Storm Sewer, Stormwater Force Main		

Where an underground water main is being laid **less than three feet horizontally** from another pipeline and where an underground water main is **crossing another pipeline and is being laid less than the required minimum vertical distance from the other pipeline**:

Use of pipe, or casing pipe, having high impact strength (i.e., having an impact strength at least equal to that of 0.25-inch-thick ductile iron pipe) or concrete encasement at least four inches thick for both the water main **and** for the other pipeline if it is new and is conveying wastewater or reclaimed water.

Disclaimer – This document is provided for your convenience only. Please refer to Rule 62-555.314, F.A.C., for additional construction requirements.

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22x34

SOUTH 301 W
WATER AND WASTEWATER PIPELINES

CITY OF ZEPHYRHILLS, FLORIDA

PREPARED FOR:

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH ACIE FRASER, P.E. ON DATE ADJACENT TO SEAL.

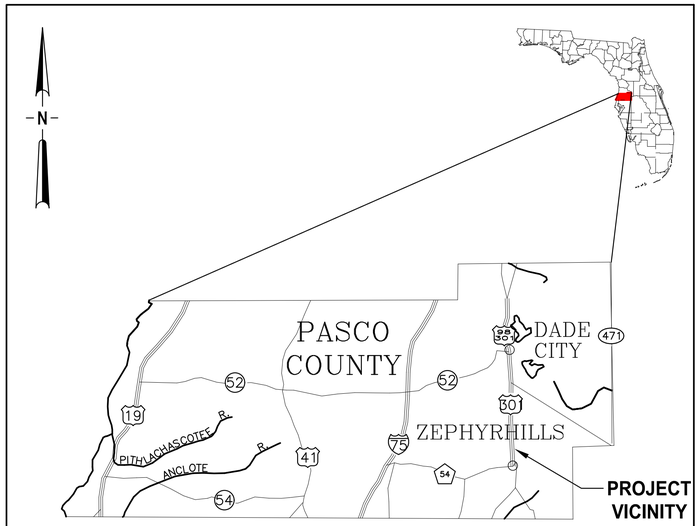
Kenneth A Fraser — Digitally signed by Kenneth A Fraser Date: 2023.11.08 13:08:06 -05'00'

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED. THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

JONES EDMUNDS
8657 BAYPINE ROAD, SUITE 300
JACKSONVILLE, FL 32256
E.O.R.: KENNETH ACIE FRASER, P.E., No. 57452

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING DIVISIONS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.:
GENERAL, CIVIL, EROSION CONTROL

KENNETH ACIE FRASER — LICENSE — No. 57452 — STATE OF FLORIDA — PROFESSIONAL ENGINEER



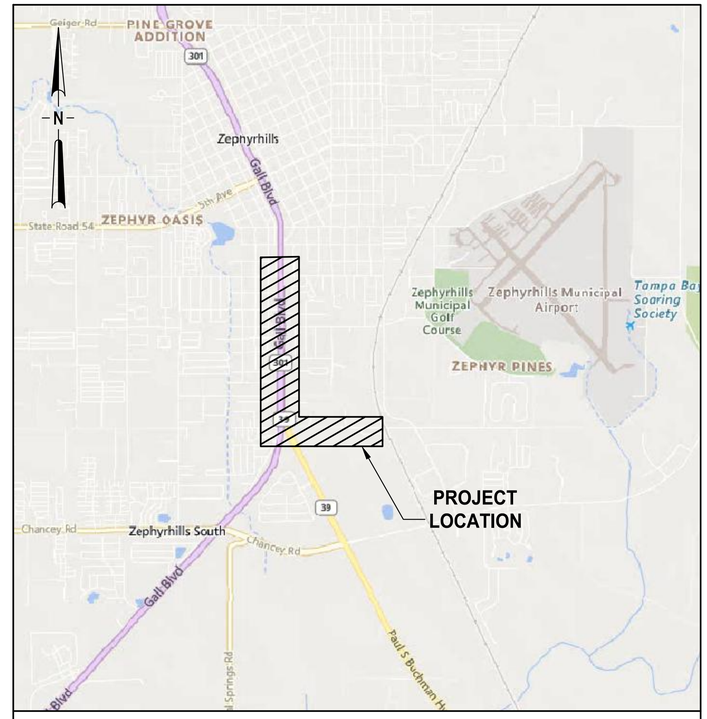
SITE VICINITY MAP

Zephyrhills
Utilities Department

PREPARED BY:

JonesEdmunds

730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
324 S. HYDE PARK AVE., SUITE 250 TAMPA, FLORIDA 33606 / (813) 258-0703



PROJECT LOCATION

PROJECT # 26110-051-01

NOVEMBER 2023

BID DOCUMENTS

LAST SAVED: 11/8/2023 10:43 AMBY:KVIRGILIO PLOTTED:11/8/2023 10:56 AMBY:KEYLA VIRGILIO, EI

PLOTTED: 11/8/2023 10:56:50 AM KEYLA VIRGILIO, EI

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GENERAL NOTES

REFERENCED DATA

1. TOPOGRAPHIC SURVEY PERFORMED BY DC JOHNSON AND ASSOCIATES, 11911 SOUTH CURLEY ST. SAN ANTONIO, FL 33576 A LICENSED PROFESSIONAL LAND SURVEYOR, DATED 3/09/2023.

2. THE SURVEY INFORMATION CONTAINED HEREIN WAS OBTAINED FOR DESIGN PURPOSES AND MAY NOT BE AN ADEQUATE REPRESENTATION OF ACTUAL CONDITIONS FOR PROJECT CONSTRUCTION. ANY EXISTING CONTOURS SHOWN REPRESENT INTERPOLATIONS/EXTRAPOLATIONS FROM THE BEST AVAILABLE SURVEY DATA. ALL RISKS RESULTING FROM THE USE OR INTERPRETATION OF THE SURVEY DATA SHOWN SHALL BE BORNE BY THE CONTRACTOR.

GENERAL

3. THE CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS AND REQUIREMENTS OF ALL PERMITS (FDEP, FDOT, PASCO COUNTY BUILDING DEPARTMENT, ETC) OBTAINED FOR THIS PROJECT.

4. THE CONTRACTOR IS ADVISED NOT TO SCALE FROM DRAWINGS BUT TO FIELD VERIFY ALL DIMENSIONS. THE DIMENSIONS OF SPECIFIED AND FURNISHED PRODUCTS AND MATERIALS TAKE PRECEDENCE OVER DIMENSIONS INDICATED ON THE DRAWINGS. IF SIGNIFICANT DEVIATIONS OCCUR, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 72 HOURS PRIOR TO CONSTRUCTION FOR A DETERMINATION AND RESOLUTION.

5. THE CONTRACTOR SHALL VERIFY THAT ALL CLEARANCES CAN BE MET. IF ANY CLEARANCES CANNOT BE MET, THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IN WRITING A MINIMUM OF 15 WORKING DAYS PRIOR TO CONSTRUCTING AND SUCH ITEM.

CONSTRUCTION LAYOUT/LIMITS OF CONSTRUCTION

6. THE CONTRACTOR SHALL OBTAIN THE SERVICES OF A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF FLORIDA FOR LAYOUT AND ESTABLISHMENT OF ELEVATIONS OF NEW WORK. PROOF OF LICENSE SHALL BE SUBMITTED TO THE ENGINEER BEFORE BEGINNING LAYOUT.

7. NO DISTURBANCE SHALL BE ALLOWED OUTSIDE OF THE RIGHT OF WAYS AND/OR THE LIMITS OF CONSTRUCTION SHOWN ON THE DRAWINGS UNLESS APPROVED BY THE OWNER OR SPECIFICALLY NOTED ON THE DRAWINGS.

EXISTING CONDITIONS

8. LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES ARE SHOWN BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF THESE DRAWINGS BUT ARE NOT PURPORTED TO BE ABSOLUTELY CORRECT. THERE MAY BE OTHER IMPROVEMENTS, UTILITIES, ETC. WHICH ARE WITHIN THE PROJECT AREA. CONTRACTOR SHALL VERIFY, PRIOR TO CONSTRUCTION, THE LOCATIONS, ELEVATIONS, DIMENSIONS, TYPES, AND CONDITIONS OF ALL EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (WHETHER OR NOT SHOWN ON THE DRAWINGS) AFFECTING THE WORK.

9. PRIOR TO SHOP DRAWING PREPARATION AND SUBMITTAL AND PURCHASE OF RELATED MATERIALS, THE CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITIES (LOCATION, SIZE, MATERIALS OF CONSTRUCTION, OUTSIDE DIAMETER, WALL THICKNESS, ROUNDNESS, ELEVATIONS, ETC.) TO WHICH CONNECTION(S) WILL BE MADE. CONTRACTOR SHALL INCLUDE FIELD MEASUREMENTS ON SHOP DRAWINGS.

10. THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IN WRITING IMMEDIATELY IF CONFLICTS BETWEEN THE DRAWINGS AND ACTUAL CONDITIONS ARE DISCOVERED. THE CONTRACTOR SHALL ACCURATELY RECORD ANY SUCH CONFLICTS ON THE RECORD DRAWINGS.

11. ANY PROPERTY CORNERS, MONUMENTS, OR BENCH MARKS WITHIN THE PROJECT AREA SHALL BE PROTECTED UNLESS OTHERWISE INDICATED FOR DEMOLITION. IF ANY SUCH ITEMS ARE IN DANGER OF DAMAGE OR HAVE BEEN DAMAGED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER IMMEDIATELY AND REPLACE/RESTORE THESE ITEMS AT NO ADDITIONAL COST TO THE OWNER. IF OWNER CHOOSES TO SELF PERFORM THE WORK OR INCURS RELATED EXPENSES, THE CONTRACTOR SHALL REIMBURSE THE OWNER FOR ALL COSTS ASSOCIATED WITH THE EFFORT.

UTILITY COORDINATION

12. THE CONTRACTOR SHALL NOTIFY ALL UTILITIES NEAR THE PROJECT AREA AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE NOTIFYING "SUNSHINE 811 CALL OF FLORIDA" AT LEAST 48 HOURS PRIOR TO ANY DIGGING WORK TO HAVE ALL EXISTING UTILITIES LOCATED. THE PHONE NUMBER IS 1-800-432-4770 AND THE WEB SITE IS WWW.SUNSHINE811.COM, IN INSTANCES WHERE DIGGING OCCURS IN WETLANDS, THE NOTIFICATION PERIOD SHALL BE INCREASED FROM AT LEAST 48 HOURS TO AT LEAST 10 DAYS.

13. FLORIDA LAW (FS 553.851) REQUIRES THAT PERSONS MAKING EXCAVATIONS IN PUBLIC STREETS, ALLEYS, RIGHT-OF-WAYS OR UTILITY EASEMENTS MUST FIRST OBTAIN INFORMATION ON LOCATIONS OF UNDERGROUND GAS PIPELINES.

14. THE CONTRACTOR SHALL PRESERVE AND MAINTAIN EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES WITHIN THE PROJECT AREA. ANY DAMAGE SHALL BE REPAIRED BY AND AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.

15. THE CONTRACTOR IS RESPONSIBLE FOR BRACING, SHORING, OR PROVIDING OTHER MEANS NECESSARY TO PROTECT AND SUPPORT EXISTING UTILITIES, STRUCTURES, AND OTHER FEATURES (EXPOSED OR UNEXPOSED) THAT MAY BE IMPACTED BY THE CONTRACTOR'S WORK.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING POWER/TELEPHONE COMPANIES AND ARRANGING TO HAVE UTILITIES POLES HELD AND/OR GUY WIRES REMOVED AND REPLACED, IF NECESSARY FOR CONSTRUCTION, AT NO ADDITIONAL COST TO THE OWNER.

SAFETY

17. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BE FAMILIAR WITH THE OSHA EXCAVATION SAFETY STANDARDS AND TO ABIDE BY THEM AS COVERED UNDER THE FLORIDA TRENCH SAFETY ACT.

18. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION SAFETY.

RESTORATION

19. ALL PAVING, STABILIZED EARTH, DRIVEWAYS, CURBS, SIDEWALKS, FENCES, SOD, LANDSCAPING, CULVERTS, ETC. DISTURBED BY CONSTRUCTION ACTIVITIES SHALL BE RESTORED BY AND AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.

ACCESS/MAINTENANCE OF FACILITIES

20. THE CONTRACTOR SHALL PROVIDE ACCESS TO ALL EXISTING UTILITIES/FACILITIES AND MAINTAIN UNINTERRUPTED SERVICES THROUGHOUT THE CONTRACT PERIOD.

PIPING NOTES

21. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS. CONTRACTOR SHALL TAKE CARE TO PROVIDE PROPER GRADE ELEVATIONS AND ALIGNMENTS.

22. SIZE OF FITTINGS SHOWN ON PLANS SHALL CORRESPOND TO THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE. TYPE OF JOINT AND FITTING MATERIAL SHALL BE AS SPECIFIED FOR THE ADJACENT STRAIGHT RUN OF PIPE UNLESS NOTED OTHERWISE.

23. CONTRACTOR SHALL CONSTRUCT NEW BELOW GRADE PIPING WITH A MINIMUM COVER OF 36". IF A MINIMUM COVER OF 36" CANNOT BE ACHIEVED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING.

24. CONTRACTOR SHALL INSTALL MINIMUM OF 1/4" THICK NEOPRENE PADDING BETWEEN PIPE AND SUPPORTS FOR DUCTILE IRON PIPE AND PIPE WITH COATINGS.

UTILITY SEPARATION

25. EACH PROPOSED UTILITY SHALL BE LAID TO ACHIEVE THE MINIMUM HORIZONTAL SEPARATION BETWEEN IT AND OTHER UTILITIES IN ACCORDANCE WITH THE TYPICAL UTILITY HORIZONTAL SEPARATION DETAIL AND FDEP REQUIREMENTS.

26. AT LOCATIONS WHERE A PROPOSED UTILITY CROSSES ANOTHER UTILITY, THE PROPOSED UTILITY SHALL BE INSTALLED IN ACCORDANCE WITH THE TYPICAL UTILITY CONFLICT DETAIL AND FDEP REQUIREMENTS.

27. IN THE EVENT THAT A UTILITY CONFLICT CAN NOT BE RESOLVED BY MAKING A MINOR ROUTE ADJUSTMENT OR BY UTILIZING THE TYPICAL UTILITY CONFLICT DETAIL, THE CONTRACTOR SHALL SUBMIT A RELOCATION PLAN TO THE ENGINEER FOR APPROVAL PRIOR TO COMMENCING WORK. ALL RELOCATION EFFORTS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER AND ANY AFFECTED UTILITY COMPANIES.

PROJECT SPECIFIC

28. ALL UTILITIES SHALL BE KEPT IN OPERATION EXCEPT WITH THE WRITTEN CONSENT OF THE UTILITY OWNER.

29. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING EXISTING UTILITIES AND PAVEMENT THAT THE CONTRACTOR DAMAGES DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER. REPAIRS SHALL BE CONDUCTED UNDER THE SUPERVISION OF THE OWNER AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND THESE DRAWINGS.

30. THE CONTRACTOR SHALL PROVIDE A MINIMUM OF TWO WEEKS NOTICE TO THE OWNER PRIOR TO CONNECTING THE NEW CONSTRUCTION, EQUIPMENT, AND PIPING TO THE CITY OF ZEPHYRHILLS WWTF. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND SCHEDULING EACH CONNECTION WITH THE OWNER TO ENSURE THAT THERE ARE MINIMAL INTERRUPTIONS TO EACH SYSTEM.

31. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING AND STABILIZING POWER POLES DURING CONSTRUCTION. THE CONTRACTOR SHALL CONTACT THE ELECTRIC UTILITY PROVIDER AND COORDINATE WITH THEM.

32. CONTRACTOR SHALL REMOVE TREE(S) WHEN IN DIRECT CONFLICT W/ PROPOSED WORK, AS APPROVED BY THE ENGINEER. CONTRACTOR SHALL OBTAIN PERMIT(S) REQUIRED.

33. PLEASE NOTE EXISTING UTILITIES AS SHOWN IN THE DRAWINGS ARE BASED ON AVAILABLE GIS DATA. CONTRACTOR SHALL VERIFY EXISTING UTILITIES LOCATIONS PRIOR TO CONSTRUCTION.

SPECIAL REQUIREMENTS TO HAND-DIG EXCAVATIONS FOR EXISTING UTILITY COORDINATION

34. PLEASE NOTE AREAS OF EXISTING UTILITIES IN CLOSE PROXIMITY TO THE PROPOSED INSTALLATION HAVE BEEN NOTED WITH DASHED RECTANGULAR BOXES SHOWN IN THE PLANS.

35. IN THE NOTED AREAS AND OTHER AREAS IDENTIFIED DURING CONSTRUCTION, THE CONTRACTOR SHALL HAND DIG ALL EXCAVATIONS WITHIN 10 FEET IN ALL DIRECTIONS OF A MARKED LOCATED UTILITY LINE.

36. THE CONTRACTOR SHALL ALSO HAND DIG A PILOT TRENCH WHEN CALLED FOR ON THE DIG PERMIT FOR ALL UNDERGROUND UTILITY WORK ALONG THE CENTERLINE OF NEW TRENCHES AND DOWN TO THE BOTTOM ELEVATION OF THE NEW UTILITY.

37. MACHINE EXCAVATION SHALL PROCEED ONLY AFTER IT IS DETERMINED THAT ALL EXISTING UTILITIES HAVE BEEN IDENTIFIED AND PROTECTED.

SOIL CONTAMINATION AREA

38. ONE AREA OF SOIL CONTAMINATION IS IDENTIFIED ON THE PLANS ON SHEET C8. AS A MINIMUM, THECONTRACTOR SHALL WEAR PPE WHEN WORKING IN SOIL OR GROUNDWATER IN THE AREA NOTED.

39. SOIL THAT IS DISTURBED SHALL NOT BE TAKEN OFF SITE. SOIL SHALL BE PLACED BACK WITHIN THE PROJECT BOUNDARY.

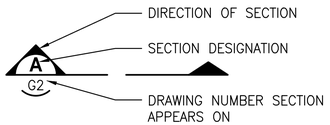
40. IN THE EVENT DEWATERING IS REQUIRED FOR THE INSTALLATION, THE CONTRACTOR SHALL CONFORM TO ENVIRONMENTAL REGULATIONS FOR THE PUMPING AND DISPOSAL OF GROUNDWATER FOR THE INSTALLATION. DEWATERING PLANS AND PERMITS SHALL INCLUDE A DETAILED SITE PLAN AND SHALL BE SUBMITTED TO THE OWNER PRIOR TO ANY WORK BEING PERFORMED IN AREAS WITH GROUNDWATER CONTAMINATION.

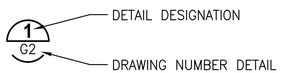
HORIZONTAL DIRECTIONAL DRILL NOTES

41. BORING LAYOUT BASED ON MINIMUM RADIUS OF 400 FEET. MAXIMUM BACK REAMER DIAMETERS SHALL BE
    19.8-INCH FOR 12-INCH DR-11 HDPE PIPE
    13.6-INCH FOR 6-INCH DR-11 HDPE PIPE

42. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNERS FOR ACCESS DURING UTILITY INSTALLATION.

43. BORE DEPTH ON BORES BENEATH FDOT ROADWAY PAVEMENT SHALL BE 10X THE BACK REAMER SIZE PER UAM 3.16.9.1.

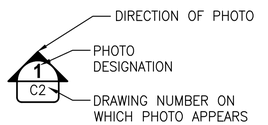




SECTION DESIGNATION



DETAIL DESIGNATION



SECTION DESIGNATION

PHOTO DESIGNATION

DRAWING INDEX

DWG. NO.	SHEET DESCRIPTION
GENERAL	
G1	COVER SHEET
G2	DRAWING INDEX, GENERAL NOTES AND DESIGNATION
G3	ABBREVIATIONS
G4	LEGENDS AND PIPE SCHEDULE
G5	SURVEY LEGEND AND NOTES
G6	KEY MAP
FORCEMAIN	
C1	FORCEMAIN PLANS
C2	FORCEMAIN PLANS
C3	FORCEMAIN PLANS
C4	FORCEMAIN PLANS
C5	FORCEMAIN PLANS
C6	FORCEMAIN PLANS
C7	FORCEMAIN PLANS
C8	FORCEMAIN PLANS
C9	FORCEMAIN PLANS
C10	FORCEMAIN PLANS
C11	FORCEMAIN PLANS
C12	FORCEMAIN PLANS
C13	FORCEMAIN PLANS
C14	FORCEMAIN PLANS
C15	FORCEMAIN PLANS
WATERMAIN	
C16	WATERMAIN PLANS
C17	WATERMAIN PLANS
C18	WATERMAIN PLANS
C19	WATERMAIN PLANS
C20	WATERMAIN PLANS
C21	WATERMAIN PLANS
C22	WATERMAIN PLANS
C23	WATERMAIN PLANS
CIVIL DETAILS	
C24	CIVIL DETAILS
C25	CIVIL DETAILS
C26	CIVIL DETAILS
C27	CIVIL DETAILS
C28	CIVIL DETAILS
C29	CIVIL DETAILS
EROSION CONTROL	
EC1	STORMWATER POLLUTION PREVENTION DETAILS
EC2	STORMWATER POLLUTION PREVENTION DETAILS
EC3	STORMWATER POLLUTION PREVENTION DETAILS

BID DOCUMENTS

SAVED: 10/27/2023 8:33 AM SSIMS Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\051-01 SOUTH 301 W-WW PIPELINES\DESIGN&CONSTRUCTION\CAD\DWGS\GENERAL\26110051101-G02.DWG

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

DRAWING INDEX, GENERAL NOTES AND DESIGNATION

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH A. FRASER, PE #57452 ON THE DATE SHOWN ON THE COVER SHEET.

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PROJECT NO: 26110-051-01
DATE: NOV. 2023
INDEX NO:
DWG NO: G2

PLOTTED: 11/8/2023 10:56:59 AM KEYLA VIRGILIO, EI

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STANDARD ABBREVIATIONS

&	AND
@	AT
A	AUTOMATIC
AA STD	ALUMINUM ASSOCIATION STANDARD
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
AB	ALIGNMENT BEGINNING
AC	ASBESTOS CEMENT
AC	ALTERNATING CURRENT
AC	AIR CONDITIONER
ACI	AMERICAN CONCRETE INSTITUTE
ADJ	ADJUSTABLE
AE	ALIGNMENT END
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIP	ABANDONED IN PLACE
AISI	AMERICAN IRON STEEL INSTITUTE
AIT	ANALYTICAL INDICATING TRANSMITTER
ALT	ALTERNATIVE
ALUM	ALUMINUM
AM	AUTO-MANUAL
AMPS	AMPERES
ANSI	AMERICAN NATION STANDARDS INSTITUTE
AP	ANALYZER PANEL
APP	APPROVE, APPROVED
APPROX	APPROXIMATE
AR	AIR RELEASE
ARV	AIR RELEASE VALVE
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASD	ADJUSTABLE SPEED DRIVE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AVE	AVENUE
AWG	AMERICAN WIRE GUAGE
AWS	AMERICAN WELDING SOCIETY
AWWA	AMERICAN WATER WORKS ASSOCIATION
B	BORING
B/	BOTTOM OF
B/L	BASELINE OF CONSTRUCTION
BC	BARE COPPER
BF	BLIND FLANGE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BKR	BREAKER
BLD	BLIND
BLDG	BUILDING
BLVD	BOULEVARD
BM	BENCH MARK
BMP	BEST MANAGEMENT PRACTICE
BO	BLOW-OFF
BTM	BOTTOM
BTM/	BOTTOM OF
BV	BALL VALVE
BYP	BYPASS
C	CONDUIT, CONDUCTOR, CLOSE
C/L, CL	CENTERLINE
CAM	COMPUTER-AUTO-MANUAL
CAT	CATALOGUE
CB	CIRCUIT BREAKER
CC	CENTER TO CENTER
CCS	CENTRAL CONTROL SYSTEM
CF	COLUMN FOUNDATION
CFWE	CABLE FURNISHED WITH EQUIPMENT
CI	CAST IRON
CIP	CAST IN PLACE, CAST IRON PIPE
CISP	CAST IRON SLIP PIECE
CJ	CONSTRUCTION/CONTRACTION JOINT
CLF	CHAIN LINK FENCE
CLR	CLEAR
CM	COMPUTER-MANUAL
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
CO	COMPANY
COL	COLUMN
COM	COMMUNICATION
CON	CONCENTRIC
CONC	CONCRETE
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
CORP	CORPORATION
CP	CONTROL PANEL
CPT	CONTROL POWER TRANSFORMER
CRE	CORROSION RESISTANT
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
CS	CARBON STEEL
CT	CURRENT TRANSFORMER, CABLE TRAY CONTACTOR
CTRD	CENTERED
CV	CHECK VALVE
D	DRAIN
DB	DUCT BANK
DBI	DITCH BOTTOM INLET
DC	DIRECT CURRENT
DES	DESIGNATION
DET	DETAIL
DI	DUCTILE IRON
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
DIPS	DUCTILE IRON PIPE SIZE
DIV	DIVISION
DN	DOWN, DAMPER
DR	DIMENSION RATIO
DWG	DRAWING
DXS	DOUBLE EXTRA STRONG
E	EAST(ING)
EA	EACH
ECC	ECCENTRIC
EES	EMERGENCY EYEWASH AND SHOWER
EF	EACH FACE, EXHAUST FAN
EG	SUCH AS
EJ	EXPANSION JOINT
EL, ELEV	ELEVATION
ELB	ELBOW
ELEC	ELECTRICAL
EOP	EDGE OF PAVEMENT
EQ	EQUAL
ERCP	ELLIPTICAL REINFORCED CONCRETE PIPE
EST	ELEVATED STORAGE TANK
ETC	ETCETERA
EW	EACH WAY
EXIST	EXISTING
FBC	FLORIDA BUILDING CODE
F, FU	FUSE
F/F	FINISHED FLOOR
FAB	FABRICATED
FAC	FLORIDA ADMINISTRATIVE CODE
FCA	FLANGED COUPLING ADAPTER
FCV	FLOW CONTROL VALVE
FDEP	FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
FDN	FOUNDATION
FDOT	FLORIDA DEPARTMENT OF TRANSPORTATION
FDR	FEEDER
FE	FLOW ELEMENT
FF	FINISHED FLOOR
FFE	FINISHED FLOOR ELEVATION
FG	FINISHED GRADE, FIBERGLASS
FH	FIRE HYDRANT
FIG	FIGURE
FIN	FINISHED
FIT	FLOW INDICATING TRANSMITTER
FJ	FLANGED JOINT
FL	FLOOR
FLEX	FLEXIBLE
FLG	FLANGE(D)
FND	FOUNDATION
FNPT	FEMALE NATIONAL PIPE THREAD
FO	FIBER OPTIC
FOS	FAST-OFF-SLOW
FOSA	FAST-OFF-SLOW-AUTO
FOSR	FAST-OFF-SLOW-REMOTE
FP	FULL PENETRATION, FIELD PANEL
FR	FORWARD-REVERSE
FREQ	FREQUENCY
FRP	FIBER REINFORCED PLASTIC
FS	FLORIDA STATUTES, FAR SIDE, FLOW SWITCH
FT	FOOT
G	GROUND
GAL	GALLON
GALV	GALVANIZED
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERUPTER
GND	GROUND
GPM	GALLONS PER MINUTE
GR	GRADE
GRTG	GRATING
GS	GALVANIZED STEEL
GSP	GALVANIZED STEEL PIPE
GST	GROUND STORAGE TANK
GV	GATE VALVE
H	HIGH
HA	HAND AUGER
HD	HAND
HDD	HORIZONTAL DIRECTIONAL DRILL
HDNS	HARDNESS
HDPE	HIGH DENSITY POLYETHYLENE
HHWL	HIGH HIGH WATER LEVEL
HK	HOOK
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
HR	HANDRAIL
HSP	HIGH SERVICE PUMP
HT	HEIGHT
HWL	HIGH WATER LEVEL
I&C	INSTRUMENTATION AND CONTROL
IC	INTERRUPTING CAPACITY
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
IF	INSULATED FLANGE
IJ	ISOLATION JOINT
INC	INCORPORATED
IPS	IRON PIPE SIZE
J, JB	JUNCTION BOX
JT	JOINT
KA	KILOAMPERES
KB	KNEE BRACE
KCMIL	THOUSAND CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT AMPERES
KW	KILOWATTS
KWH	KILOWATT HOUR
L	LOWER
LB, LBS	POUND(S)
LE	LEVEL ELEMENT
LEL	LOWER EXPLOSIVE LIMIT
LF	LINEAR FEET
LG	LONG
LIT	LEVEL INDICATING TRANSMITTER
LIU	LIGHT INTERFACE UNIT
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LLWL	LOW LOW WATER LEVEL
LOS	LOCKOUT STOP
LR	LONG RADIUS, LOCAL-REMOTE
LS	LIFT STATION
LSIG	LONG SHORT INSTANTANEOUS GROUND
LWL	LOW WATER LEVEL
M	MAGNETIC CONTACTOR COIL, MOTOR, MANUAL
M/F	MALE/FEMALE
MAX	MAXIMUM
MC	MODULATE-CLOSE
MCC	MOTOR CONTROL CENTER
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MES	MITERED END SECTION
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MNPT	MALE NATIONAL PIPE THREAD
MO	MOTOR OPERATOR
MP	METERING PUMP
MPH	MILES PER HOUR
MS	MOTOR STARTER
MSC	MANUFACTURER SUPPLIED CABLE
MT, MTD	MOUNT(ED)
MTL	METAL
MV	MEDIUM VOLTAGE
N	NORTH(ING), NEUTRAL, NORMAL
N/A	NOT APPLICABLE
NAD	NORTH AMERICAN DATUM
NAVD	NORTH AMERICAN VERTICAL DATUM
NC	NORMALLY CLOSED
NE	NORTH EAST
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NEUT	NEUTRAL
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NOM	NOMINAL
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NPT	NATIONAL PIPE THREAD
NPW	NON POTABLE WATER
NRS	NONRISING STEM
NS	NEAR SIDE
NSF	NATIONAL SANITATION FOUNDATION
NTS	NOT TO SCALE
NW	NORTH WEST
OC	ON CENTER(S), OPEN-CLOSE(D)
OCA	OPEN-CLOSE-AUTO
OCR	OPEN-CLOSE-REMOTE
OD	OUTSIDE DIAMETER
OF	OVERFLOW
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
OPP	OPPOSITE
ORP	OXIDATION REDUCTION POTENTIAL
OS&Y	OUTSIDE STEM AND YOKE
OSC	OPEN-STOP-CLOSE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
P&ID	PIPING AND INSTRUMENTATION DIAGRAM
P/L	PROPERTY LINE
PB	PULL BOX
PCCP	PRESTRESSED CONCRETE CYLINDER PIPE
PCV	PRESSURE CONTROL VALVE
PE	PLAIN END, POLYETHYLENE
PET	POLYETHYLENE TUBING
PF	POWER FACTOR
pH	HYDROGEN ION CONCENTRATION
PH	PHASE
PI	POINT OF INTERSECTION/PLANT INFLUENT
PID	PROPORTIONAL INTEGRAL DERIVATIVE
PIT	PRESSURE INDICATING TRANSMITTER
PIV	POST INDICATOR VALVE
PL	PLATE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PLCS	PLACES
POC	POINT OF CONNECTION
POE	POINT OF ENTRY
POJ	PUSH ON JOINT
PP	POWER POLE
PPE	PERSONAL PROTECTIVE EQUIPMENT
PRV	PRESSURE REDUCING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH ABSOLUTE
PSID	POUNDS PER SQUARE INCH DIFFERENTIAL
PSIG	POUNDS PER SQUARE INCH GAUGE
PSV	PRESSURE SUSTAINING VALVE
PT	PRESSURE TREATED, POTENTIAL TRANSFORMER
PV	PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PW	POTABLE WATER
PWR	POWER
R	RADIUS
R/W, ROW	RIGHT-OF-WAY
RCP	REINFORCED CONCRETE PIPE
RCPT	RECEPTACLE
RED	REDUCER
REF	REFERENCE
REINF	REINFORCEMENT, REINFORCING
REQ, REQ'D	REQUIRED
RGS	RIGID GALVANIZED STEEL
RJ	RESTRAINED JOINT
RM	REMOTE MULTIPLEXING MODULE
RMS	ROOT MEAN SQUARE
RPZ	REDUCED PRESSURE ZONE
RT	RIGHT
RTU	REMOTE TELEMETRY UNIT
SARV	SURGE ANTICIPATOR RELIEF VALVE
SBC	STANDARD BUILDING CODE
SCH	SCHEDULE
SCJ	SAW CUT JOINT
SDI	STEEL DECK INSTITUTE
SE	SOUTH EAST
SEC	SECOND
SF	SLOWER-FASTER
SHEC	SHOULDERED-END COUPLING
SHT	SHEET
SIM	SIMILAR
SJI	STEEL JOINT INSTITUTE
SM	STATIC MIXER
SP	SPACING, SPACED
SPD	SURGE PROTECTIVE DEVICE
SQ	SQUARE
SR	STATE ROAD, SURGE RELIEF
SRV	SURGE RELIEF VALVE
SS	START-STOP
SS, SST	STAINLESS STEEL
SSC	SUPERVISORY SET POINT CONTROL
SSRV	SOLID STATE REDUCED VOLTAGE
ST	SHUNT TRIP
STA	STATION
STD	STANDARD
STL	STEEL
STS	STORMWATER SEWER
SW	SOUTH WEST, SWITCH
SWD	SIDE WATER DEPTH
SWJ	SOLVENT WELD JOINT
SWPPP	STORM WATER POLLUTION PREVENTION PLAN
SY	SQUARE YARD
T, THK	THICK
T/	TOP OF
T/B,T&B	TOP AND BOTTOM
TBM	TEMPORARY BENCHMARK
TEMP	TEMPERATURE
TGS	THREADED GALVANIZED STEEL
TGSP	THREADED GALVANIZED STEEL PIPE
TH	TOTAL HEAD
THERMO	THERMOSTATIC
THD	THREADED
TJB	TERMINAL JUNCTION BOX
TK	TANK
TOC	TOP OF CONCRETE
TOS	TOP OF STEEL
TOSJ	TOP OF STEEL JOIST
TOW	TOP OF WALL
TS	TUBULAR STEEL
TSF	THICKENED SLAB FOOTING
TSP	TWISTED SHIELDED PAIR
TURB	TURBIDITY
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITER'S LABORATORIES
ULC	ULTRASONIC LEVEL CONTROLLER
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTAGE, VOLTS
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VH	VAPOR HEATER
VIB	VIBRATION
VIF	VERIFY IN FIELD
VP	VAPORIZER
W	WIDE, WATT
W/	WITH
W/O	WITHOUT
WCJ	WALL CONTROL JOINT
WF	WALL FOOTING
WGT	WEIGHT
WP	WORK POINT, WEATHERPROOF
WSE, WSEL	WATER SURFACE ELEVATION
WT	WEIGHT
WV	WATER VALVE
WWF	WELDED WIRE FABRIC
XFMR	TRANSFORMER
XS	EXTRA STRONG

CUSTOM ABBREVIATIONS

COZ	CITY OF ZEPHYRHILLS
SWFWMD	SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
ISO	ISOMETRIC
EOR	ENGINEER OF RECORD
FM	FORCE MAIN
WM	WATER MAIN

NOTES:
1. SEE LEGENDS AND PIPE SCHEDULE FOR ADDITIONAL ABBREVIATIONS.
2. NOT ALL ABBREVIATIONS MAY BE USED FOR THIS PROJECT.

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

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CHECKED D PLAVCAN

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

ABBREVIATIONS

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CIVIL LEGEND

- 90 — CONTOURS
- MATCHLINE
- RIGHT–OF–WAY BOUNDARY
- PROPERTY BOUNDARY
- EASEMENT BOUNDARY
- CENTERLINE
- WM — WATERMAIN LINE
- FM — FORCE MAIN
- G — GAS LINE
- E — ELECTRICAL LINE
- CHLORINE LINE
- SF — SF — SILT FENCE
- TB — TB — TURBIDITY BARRIER
- DEMO HATCH
- WL — WETLAND
- +100.00 — SPOT ELEVATION
- REINFORCED CONCRETE PIPE (RCP)
- TRENCH DRAIN
- S-1 — MITERED END SECTION W/ STRUCTURE DESIGNATION
- S-1 — FLARED END SECTION W/ STRUCTURE DESIGNATION
- S-1 — DITCH BOTTOM INLET W/ STRUCTURE DESIGNATION
- COORDINATE POINT
- PROPOSED SIGN
- CONCRETE
- LIMEROCK
- COMPACTED SOIL
- GRAVEL
- ASPHALT RESTORATION
- FORCEMAIN FLOW DIRECTION
- POTENTIAL UTILITY CONFLICT

MECHANICAL LEGEND

PIPING SYMBOLS

DOUBLE LINE	SINGLE LINE	
		PIPE
		WELDED PIPE
		FLANGED JOINT
		MECHANICAL JOINT OR RESTRAINED PUSH–ON JOINT
		FLEXIBLE COUPLING ADAPTER
		EXPANSION JOINT
		HUB & SPIGOT JOINT
		BALL JOINT
		FLANGED COUPLING ADAPTER W/ THRUST TIES
		FLEXIBLE COUPLING WITH THRUST TIES
		BLIND FLANGE
		ELBOW UP
		ELBOW DOWN
		TEE UP
		TEE DOWN
		FEMALE QUICK DISCONNECT FITTING
		MALE QUICK DISCONNECT FITTING

DOUBLE LINE	SINGLE LINE	
		LATERAL UP
		LATERAL DOWN
		CONCENTRIC REDUCER
		ECCENTRIC REDUCER
		UNION
		CAP
		ANCHOR
		WYE
		TEE
		CROSS
		ELBOW, 90 DEGREE
		ELBOW, 45 DEGREE
		ELBOW, 22.5 DEGREE
		ABANDON IN PLACE
		DEMOLISH AND REMOVE

VALVE SYMBOLS

- GATE
- BUTTERFLY
- BALL
- CHECK
- DIAPHRAGM
- NEEDLE
- PRESSURE RELIEF
- AIR RELEASE AND/OR VACUUM RELIEF
- REGULATED SIDE
- HYDRAULIC CONTROL VALVE

ACTUATOR SYMBOLS

- M / XX — ELECTRIC MOTOR
- EH / XX — ELECTROHYDRAULIC
- P / XX — PNEUMATIC
- H / XX — HYDRAULIC
- S — SOLENOID
- MANUAL

NOTE:

ON LOSS OF PRIMARY POWER
(PNEUMATIC, ELECTRICAL OR HYDRAULIC)
XX: FO = FAIL OPEN
FC = FAIL CLOSED
FLP = FAIL TO LAST POSITION

PIPE SUPPORT SYMBOLS

- ▲ — U–SHAPED PIPE SUPPORT
- △ — FLANGED PIPE SUPPORT
- PIPE SUPPORT W/ AXIAL LOAD SUPPORT

PIPE SCHEDULE NOTES:

GENERAL NOTES:
1. COAT BURIED AND SUBMERGED PIPE PER PIPE SPECIFICATIONS.
2. TEST LINES PER SECTION 15144 UNLESS NOTED OTHERWISE.
3. LABEL ALL PIPING PER SECTION 15075.

RESTRAINT SYSTEM NOTES:
(1) SEE RESTRAINT DETAILS C24

SPECIFIC NOTES:
(A) DISINFECT PIPING PER SECTION 15141.
(B) APPLY ABOVE GRADE PAINT SYSTEM ONLY TO PIPING EXPOSED TO SUNLIGHT. PIPING UNDER FACILITY CANOPY STRUCTURE SHALL BE CLASSIFIED AS EXPOSED TO SUNLIGHT.
(C) BURIED DUCTILE IRON PIPE SHALL BE POLYETHYLENE WRAPPED PER SECTION 15155 PART 2.11.

PIPE SCHEDULE

ABBREVIATION	FLOW STREAM IDENTIFICATION	PIPE/DUCT MATERIAL	PIPE MATERIAL ABBREV	DIMENSION RATIO (DR)	SPECIFICATION NUMBER	PIPE LINING	NORMAL MAX OPERATING PRESSURE (PSIG)	FIELD TEST PRESSURE (PSIG)	EXPOSED PIPE PAINT SYSTEM	COLOR CODE	SPECIFIC NOTES	RESTRAINT SYSTEM NOTES
FM–1	FORCE MAIN	POLYVINYL CHLORIDE	PVC	18	15291	N/A		150	N/A	GREEN	N/A	(1)
FM–2	FORCE MAIN	DUCTILE IRON	DI	N/A	15155	EPOXY		150	N/A	GREEN	N/A	(1)
FM–3	FORCE MAIN	HIGH DENSITY POLYETHYLENE	HDPE	11	15146	N/A		160	N/A	GREEN	N/A	(1)
WM–1	WATER MAIN	POLYVINYL CHLORIDE	PVC	18	15291	N/A		150	N/A	BLUE	(A)	(1)
WM–2	WATER MAIN	HIGH DENSITY POLYETHYLENE	HDPE	11	15146	N/A		160	N/A	BLUE	(A)	(1)

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

LEGENDS AND PIPE SCHEDULE

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SURVEYOR'S NOTES:

1. USE OF THIS SURVEY FOR PURPOSES OTHER THAN INTENDED, WITHOUT WRITTEN VERIFICATION, WILL BE AT THE USER'S SOLE RISK AND WITHOUT LIABILITY TO THE SURVEYOR. NOTHING HEREIN SHALL BE CONSTRUED TO GIVE ANY RIGHTS OR BENEFITS TO ANYONE OTHER THAN THOSE CERTIFIED TO. THIS SURVEY MEETS THE "STANDARDS OF PRACTICE" SET FORTH BY THE FLORIDA BOARD OF LAND SURVEYORS IN CHAPTER 5J-17 FLORIDA ADMINISTRATIVE CODE.
2. THIS SURVEY WAS PREPARED WITHOUT AN ABSTRACT OF TITLE; THEREFORE THE UNDERSIGNED MAKES NO GUARANTEES OR REPRESENTATIONS REGARDING INFORMATION SHOWN HEREON PERTAINING TO EASEMENTS, RIGHTS-OF-WAY, SETBACK LINES, AGREEMENTS, RESERVATIONS, OR OTHER SIMILAR MATTERS.
3. NO INSTRUMENTS OF RECORD REFLECTING EASEMENTS, RIGHT-OF-WAYS AND/OR OWNERSHIP WERE FURNISHED TO THE UNDERSIGNED EXCEPT AS SHOWN.
4. NO UNDERGROUND INSTALLATIONS, IMPROVEMENTS OR ENCROACHMENTS, HAVE BEEN LOCATED EXCEPT THOSE SHOWN HEREON.
5. ELEVATIONS SHOWN HEREON ARE BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), NATIONAL GEODETIC SURVEY BENCHMARK "D 663", LOCATED ALONG GALL BOULEVARD IN ZEPHYRHILLS, FL, PUBLISHED ELEVATION = 79.39' (NAVD88).
6. BEARINGS AND DISTANCES SHOWN HEREON ARE FIELD MEASURED, UNLESS OTHERWISE INDICATED.
7. THE TEXT FOR TIES TO IMPROVEMENTS INDICATES THE DIRECTION THEY LIE IN RELATION TO THE BOUNDARY.
8. SUBJECT PROPERTY MAY CONTAIN LANDS THAT ARE SUBJECT TO JURISDICTION OR RESTRICTION BY ONE OR MORE OF THE FOLLOWING AGENCIES: ARMY CORP. OF ENGINEERS, SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (S.W.F.W.M.D.) OR FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (F.D.E.P.).

SURVEYOR'S LEGEND

- IP, IR = IRON PIPE, IRON ROD
- R/W = RIGHT-OF-WAY
- EL. = ELEVATION
- I.E. = INVERT ELEVATION
- F.F. = FINISHED FLOOR ELEVATION
- RCP = REINFORCED CONCRETE PIPE
- CMP = CORRUGATE METAL PIPE
- = SET 5/8" IR "DC JOHNSON LB 4514"
- = SET NAIL & DISK "LB 4514"
- = VERTICAL CONTROL BENCHMARK
- = POWER POLE/TELEPHONE POLE
- = LIGHT POLE
- = METER POLE
- = GUY POLE
- = GUY ANCHOR
- = BOLLARD
- = POST
- = ROADSIGN
- = REFLECTOR SIGN
- = MAILBOX
- = AIR CONDITIONER
- MW = MONITORING WELL
- = CHAIN LINK FENCE
- = VINYL FENCE
- = WIRE FENCE
- = WOOD FENCE
- 81.5 = SPOT ELEVATION
- = OAK TREE (SIZE AS NOTED)
- = PALM TREE (SIZE AS NOTED)
- = PINE TREE (SIZE AS NOTED)
- = TREE (UNKNOWN VARIETY)
- W = WATER METER
- = GATE VALVE - WATER
- = BACKFLOW PREVENTER - WATER
- = WATER LINE WITNESS POST
- = FIRE HYDRANT
- = GATE VALVE - FIRE
- = UTILITY VAULT/HAND HOLE
- = ELECTRIC METER
- = ELECTRIC BOX
- OHP = OVERHEAD POWER LINE
- = GAS LINE WITNESS POST
- = GAS VALVE
- GAS = GAS LINE
- = TELEPHONE EQUIPMENT BOX
- = TELEPHONE PEDESTAL
- = TELEPHONE VAULT/HAND HOLE
- = TELEPHONE RELEASE VALVE
- = TELEPHONE LINE WITNESS POST
- OHT = OVERHEAD TELEPHONE LINE
- = FIBER OPTIC VAULT/HAND HOLE
- = FIBER OPTIC WITNESS POST
- = ASPHALT
- = CONCRETE
- = GRAVEL/DIRT ROAD

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

SURVEY LEGEND AND NOTES

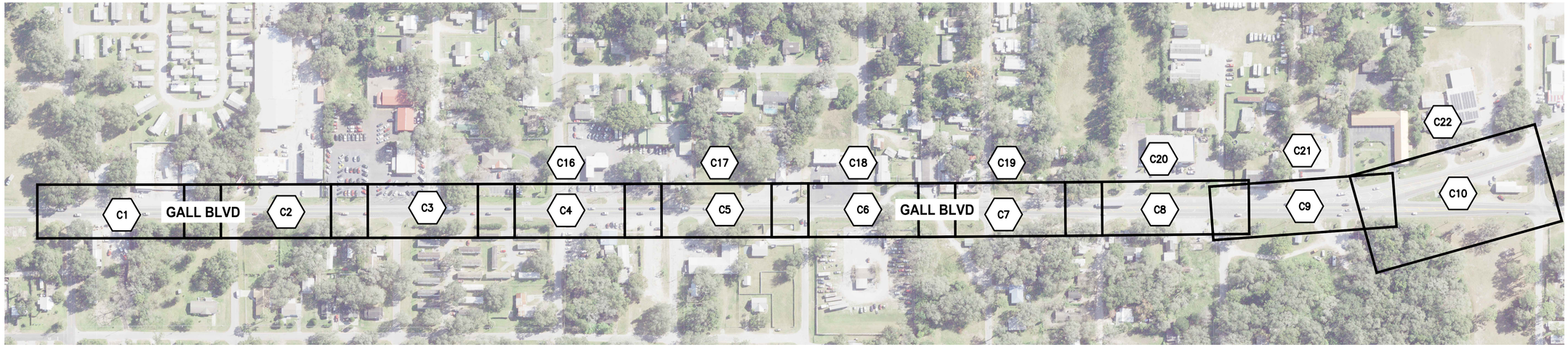
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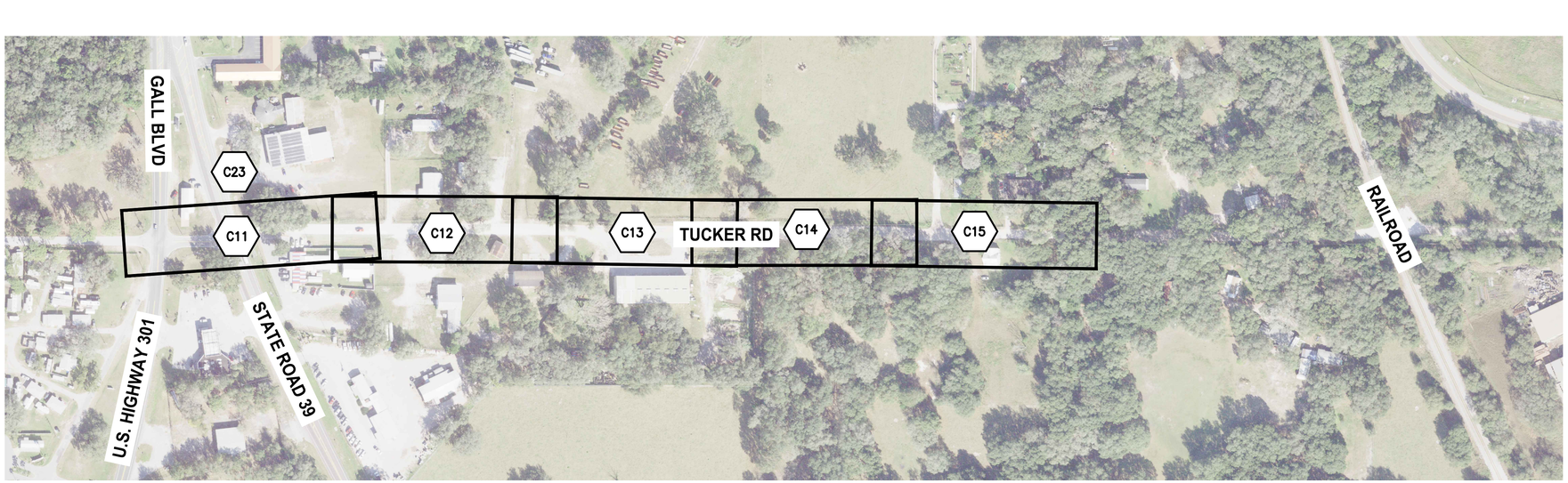
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

KEY MAP

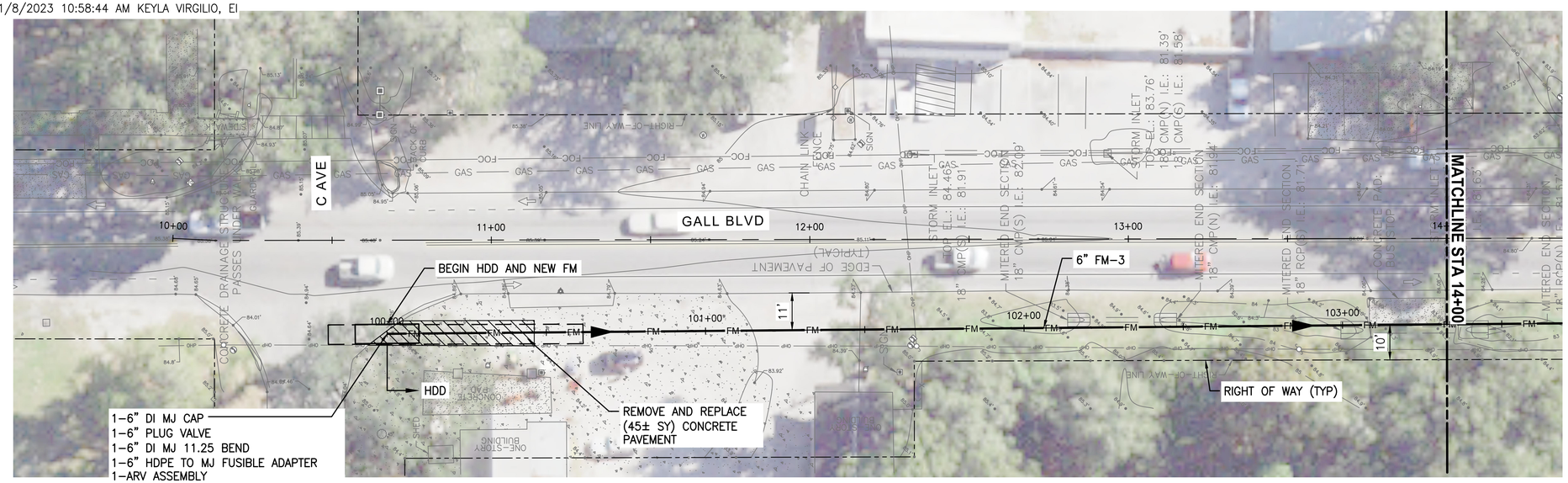
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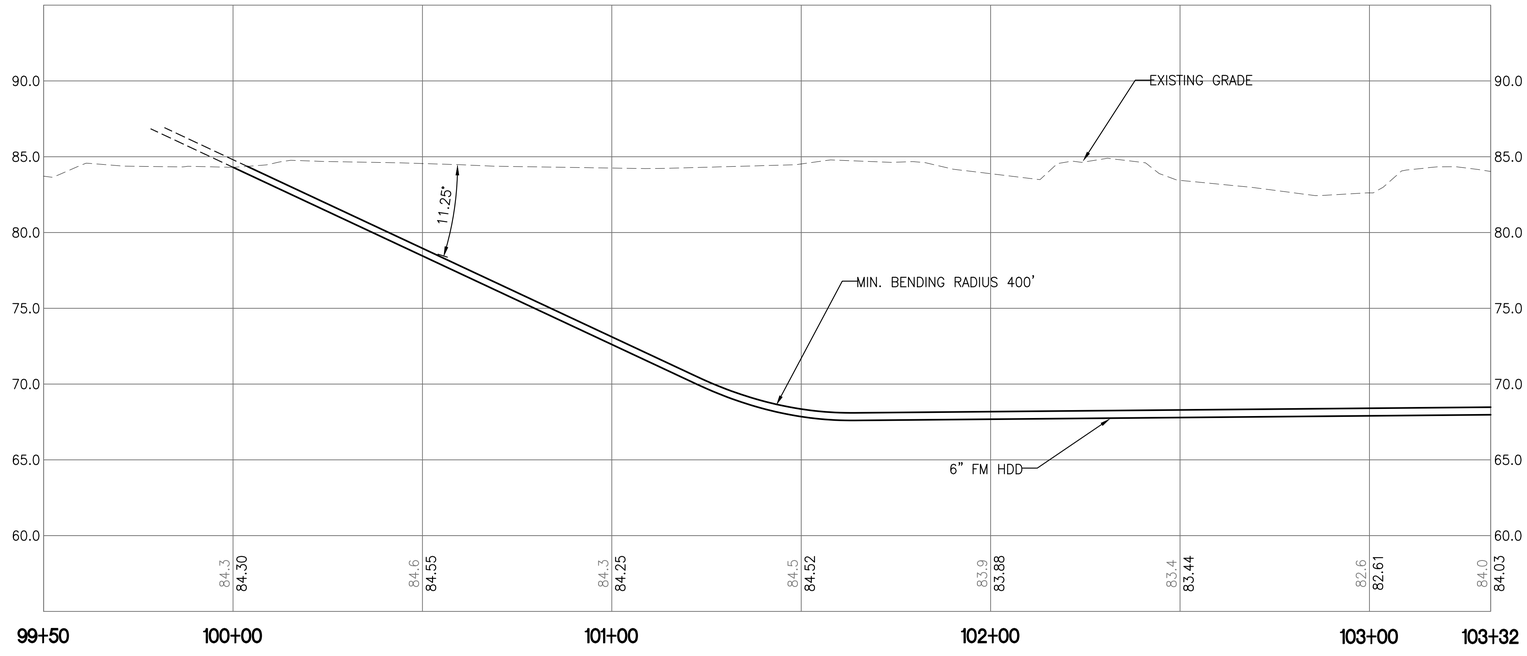
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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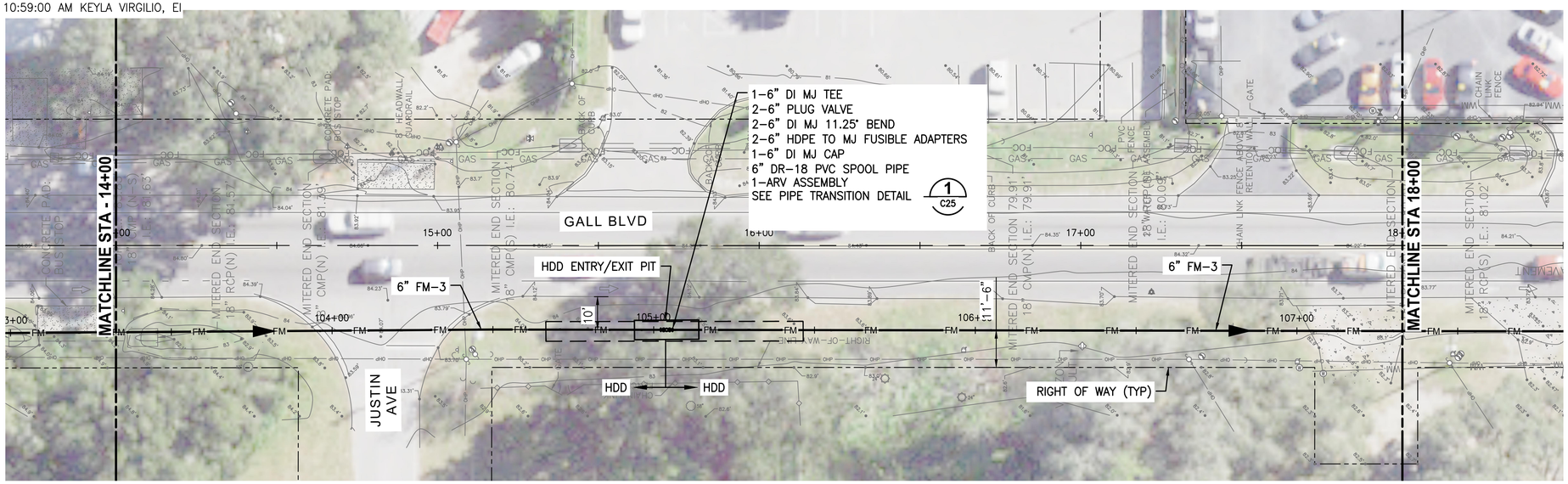
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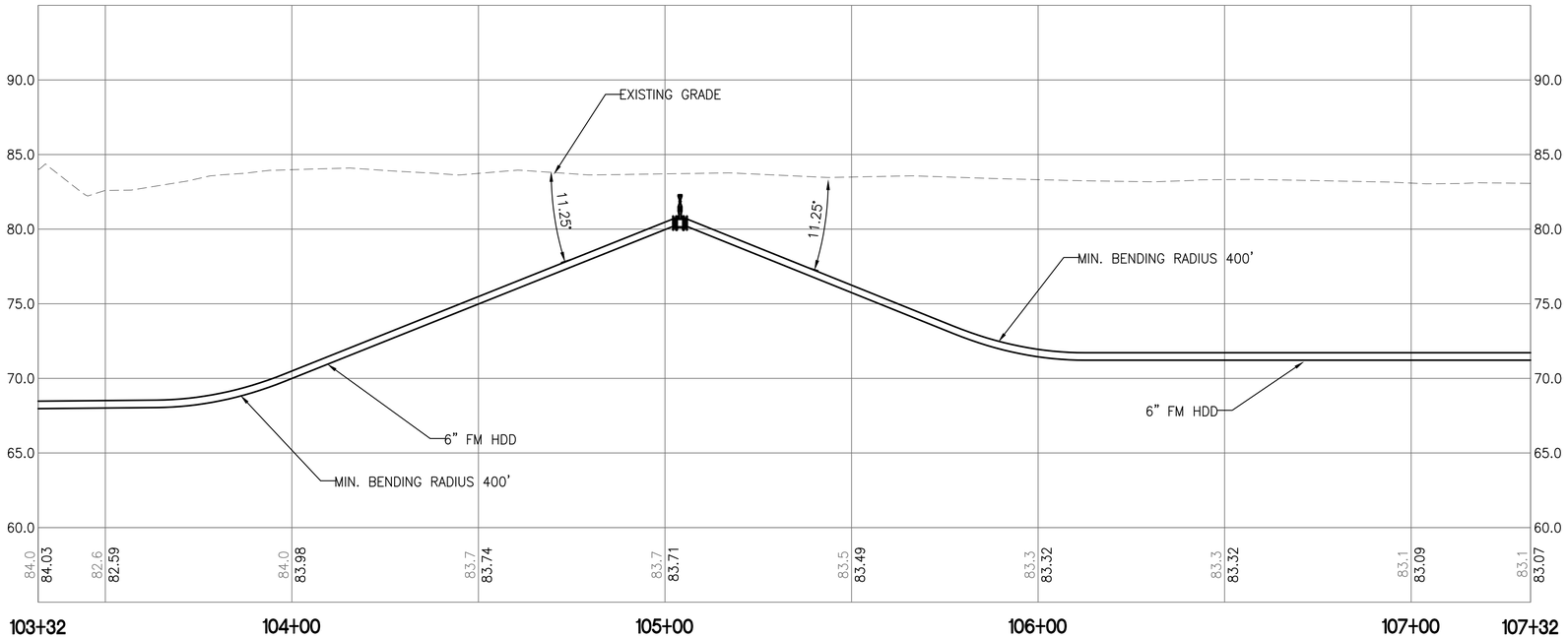
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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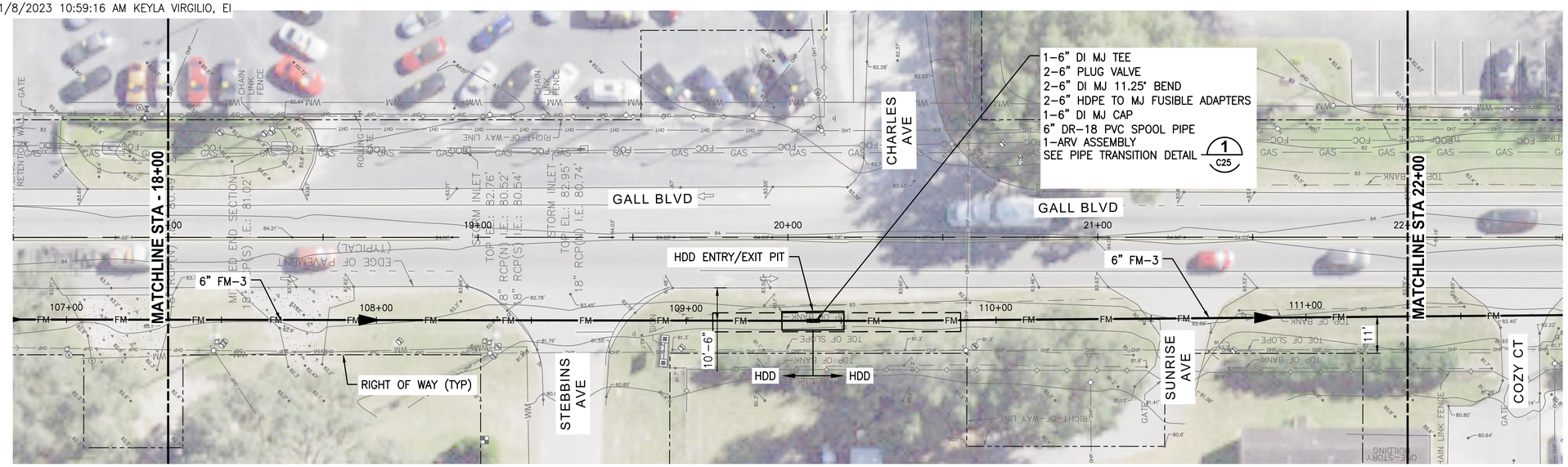
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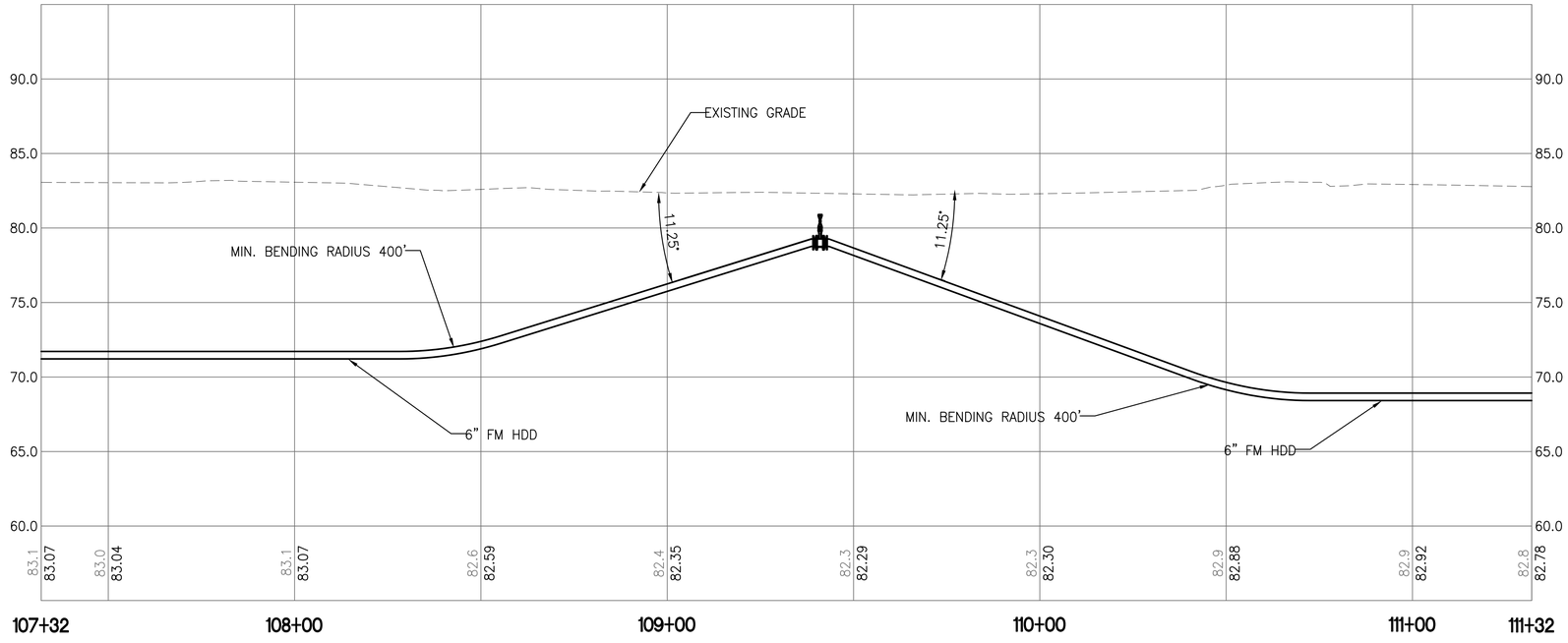
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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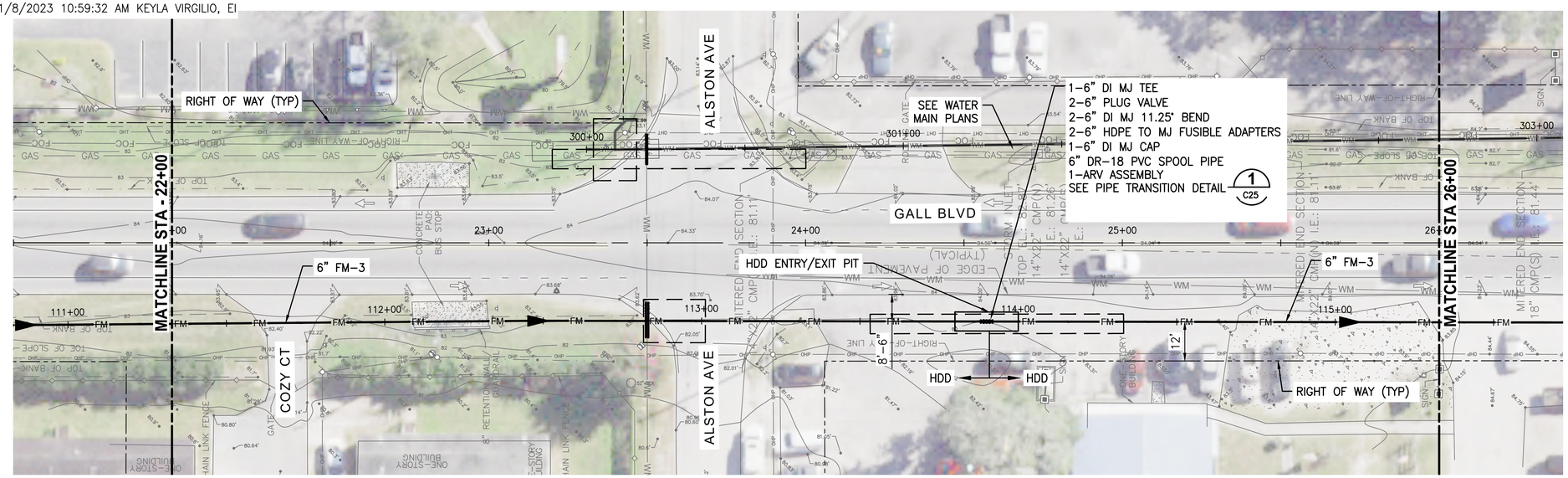
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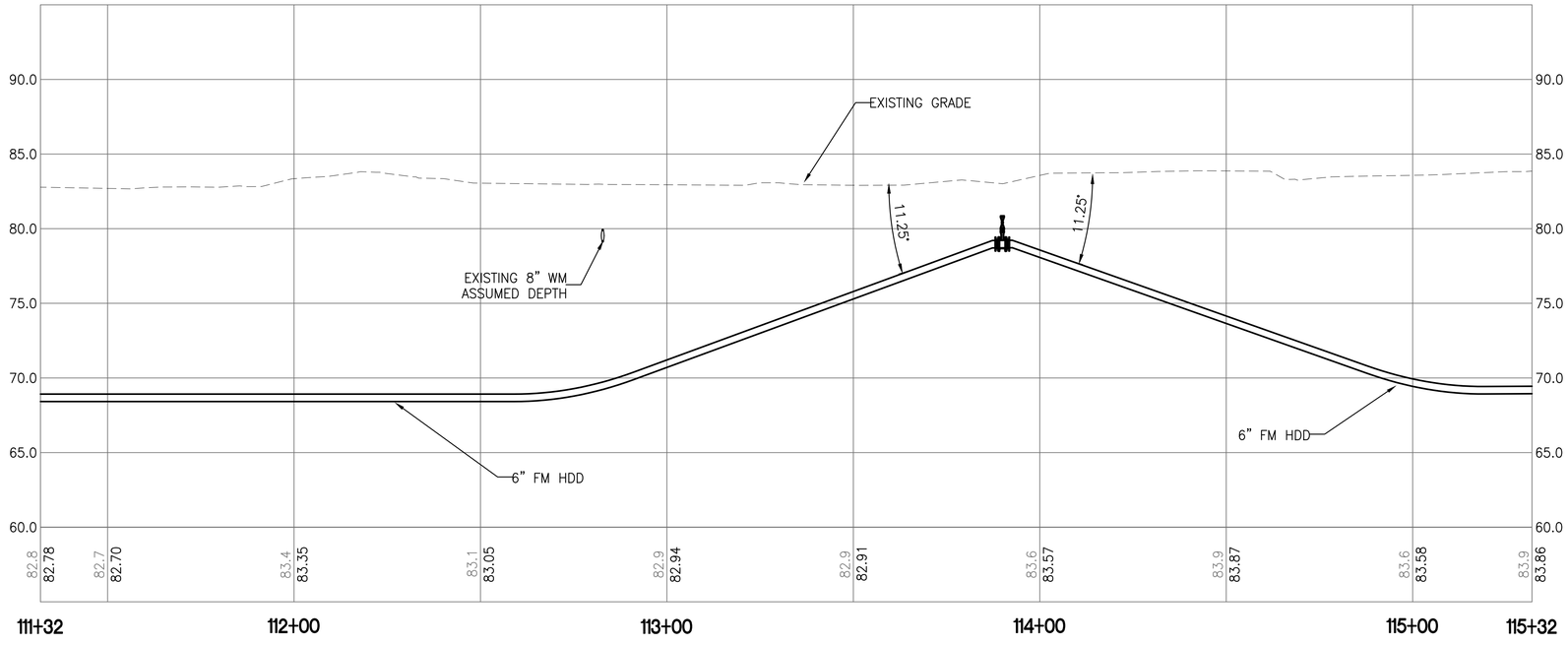
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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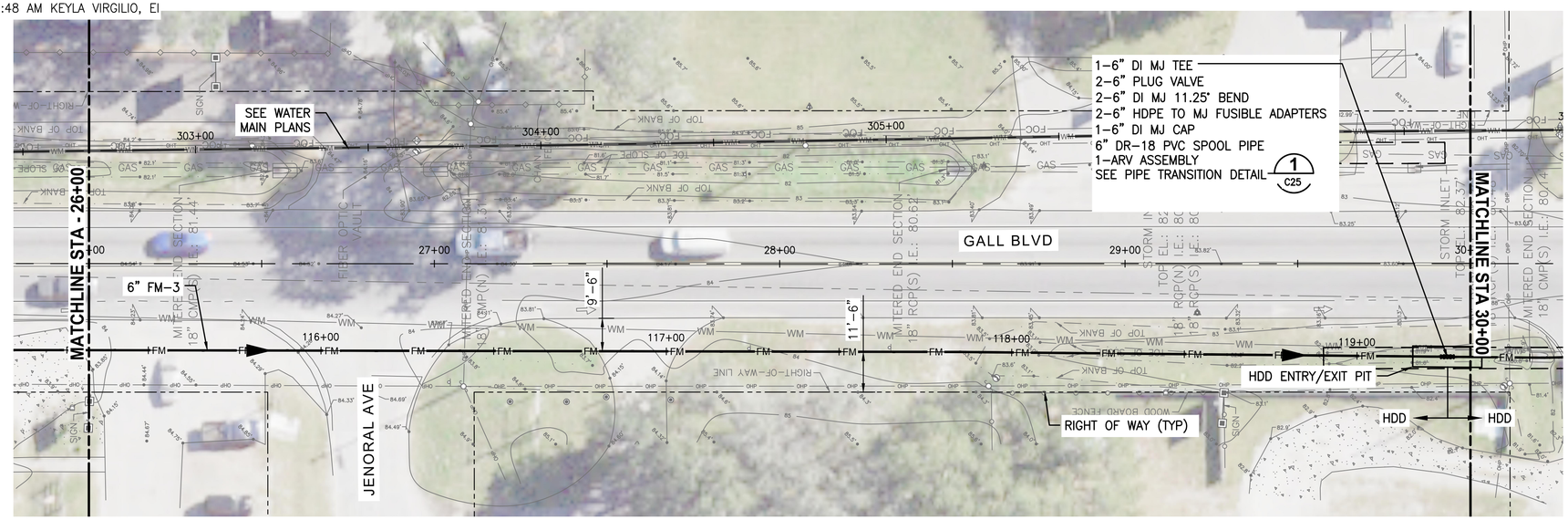
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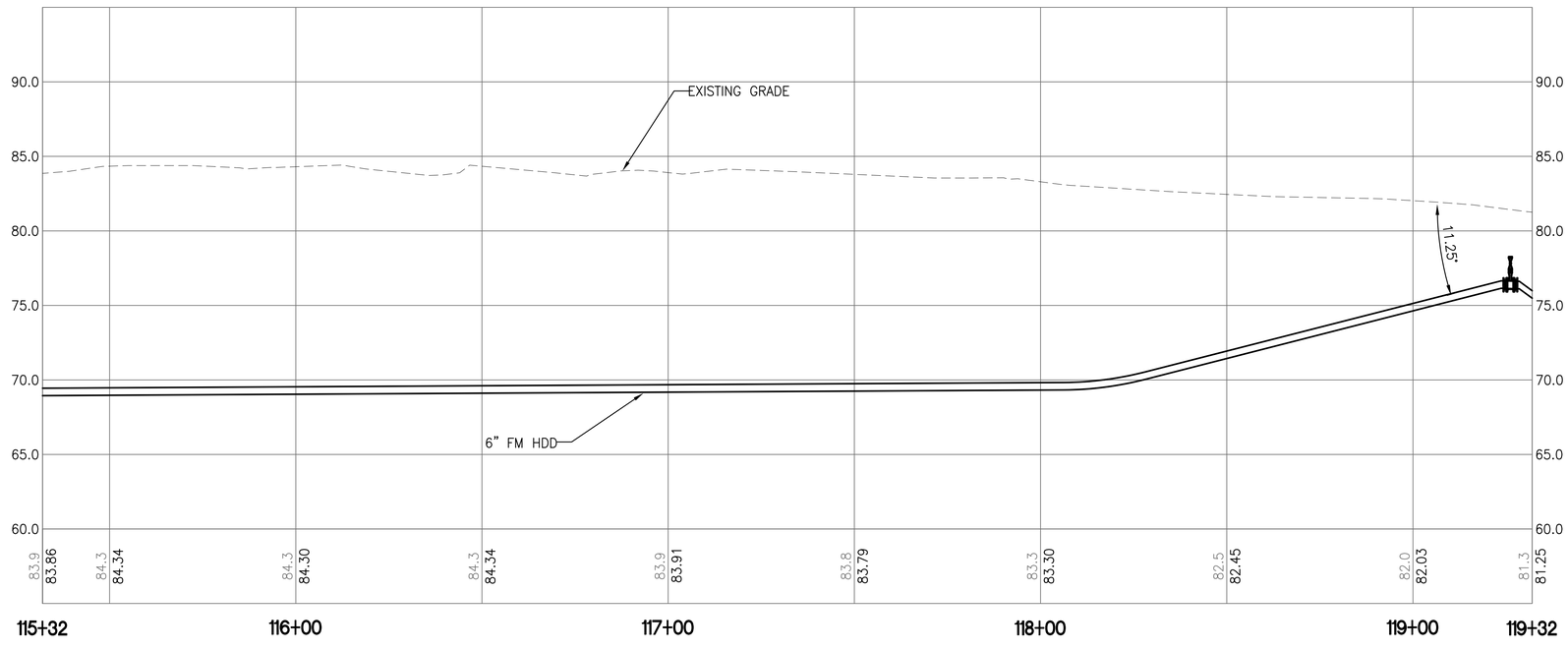
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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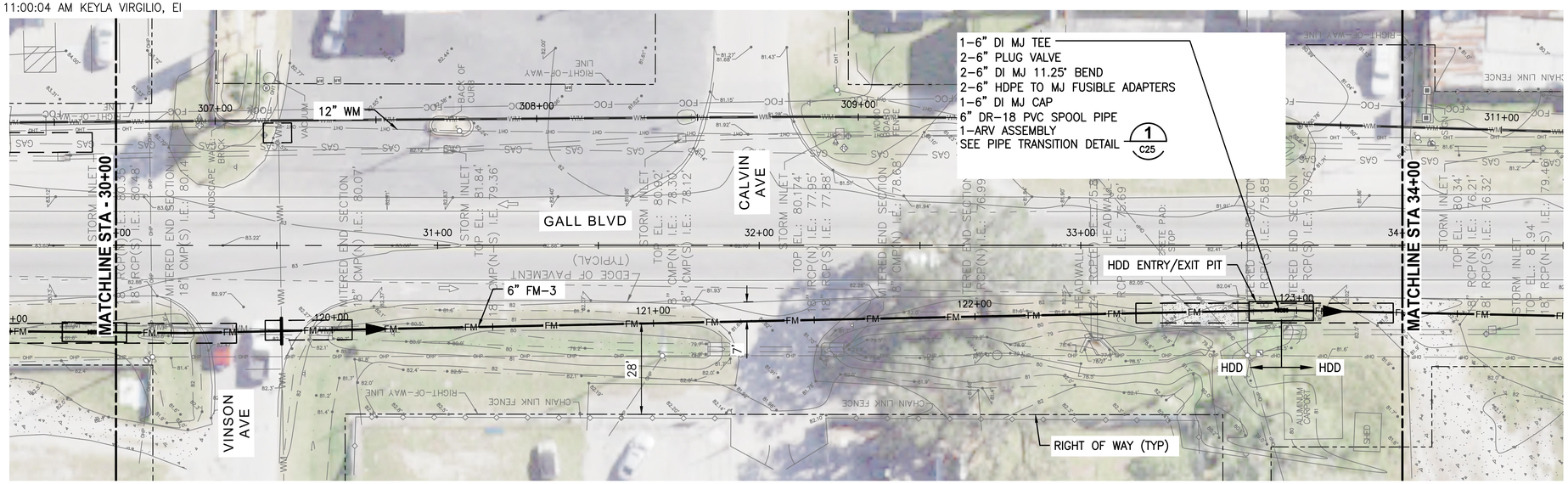
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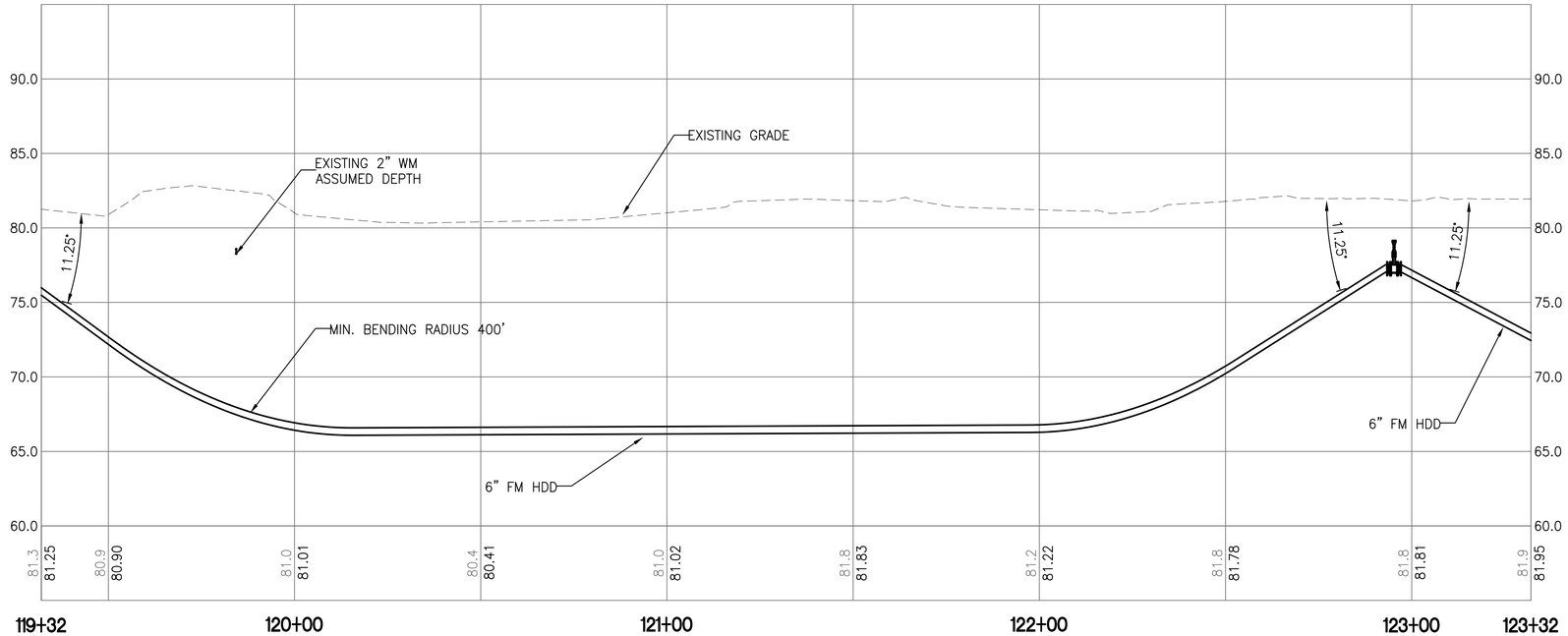
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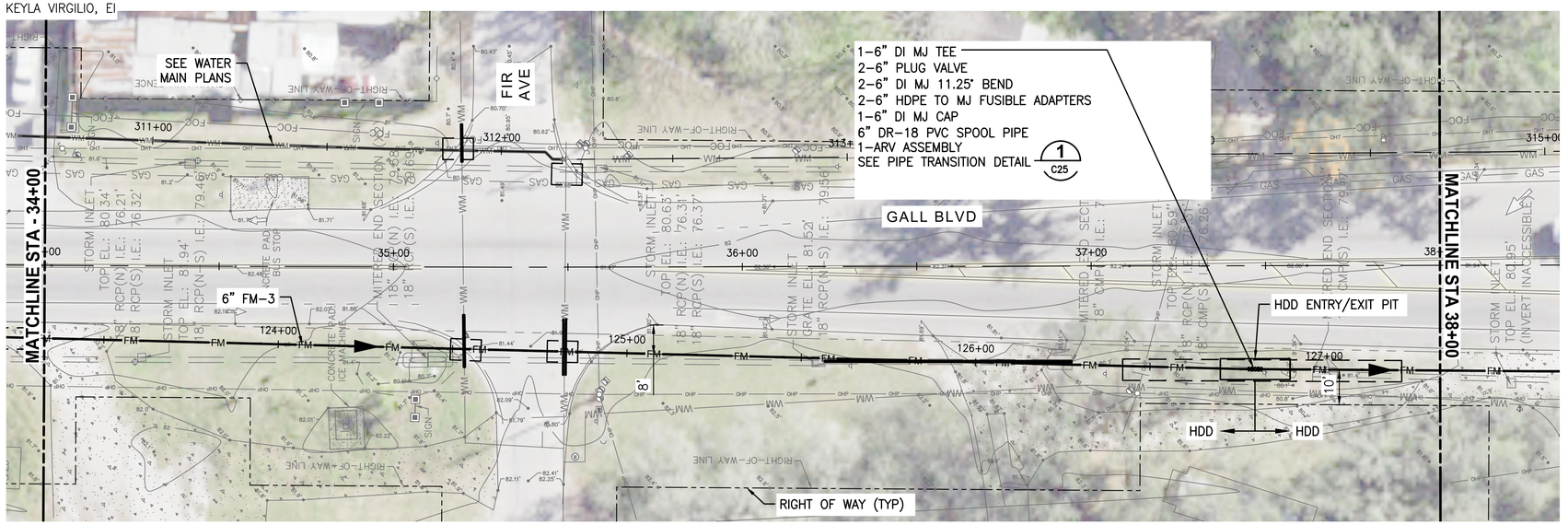
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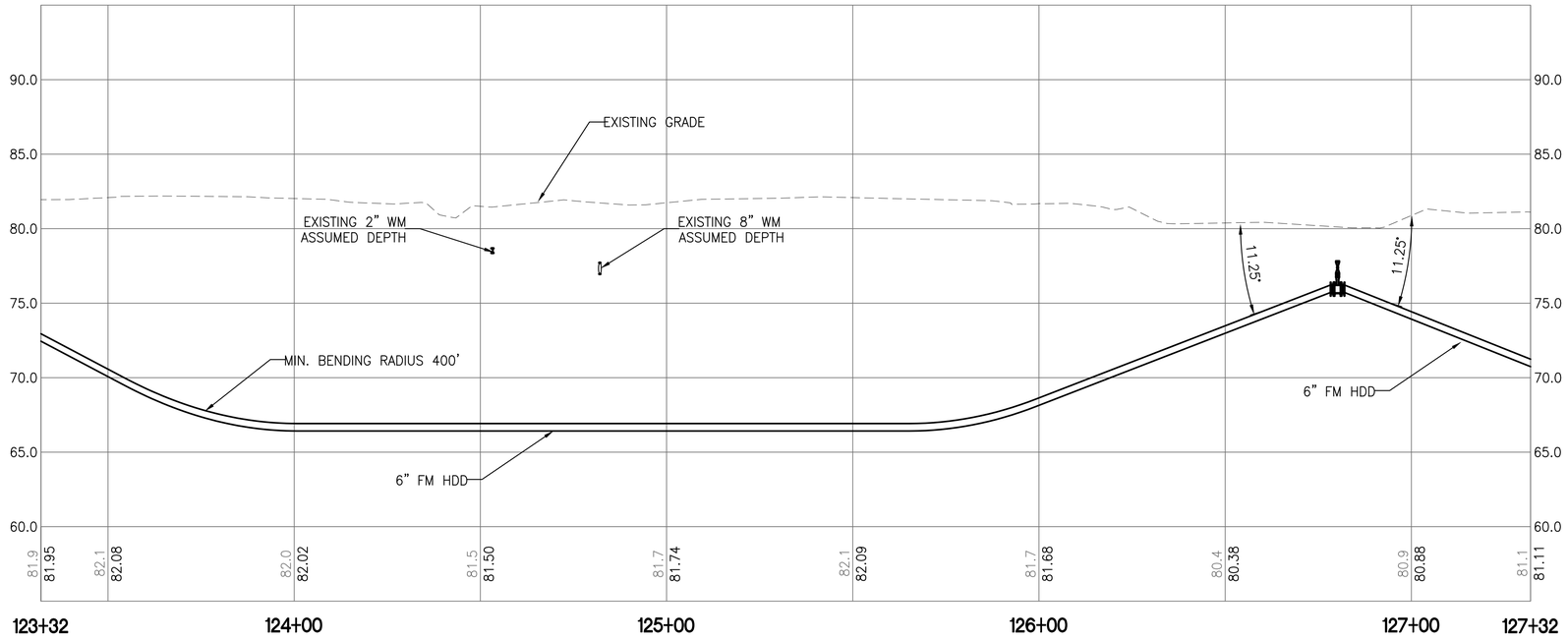
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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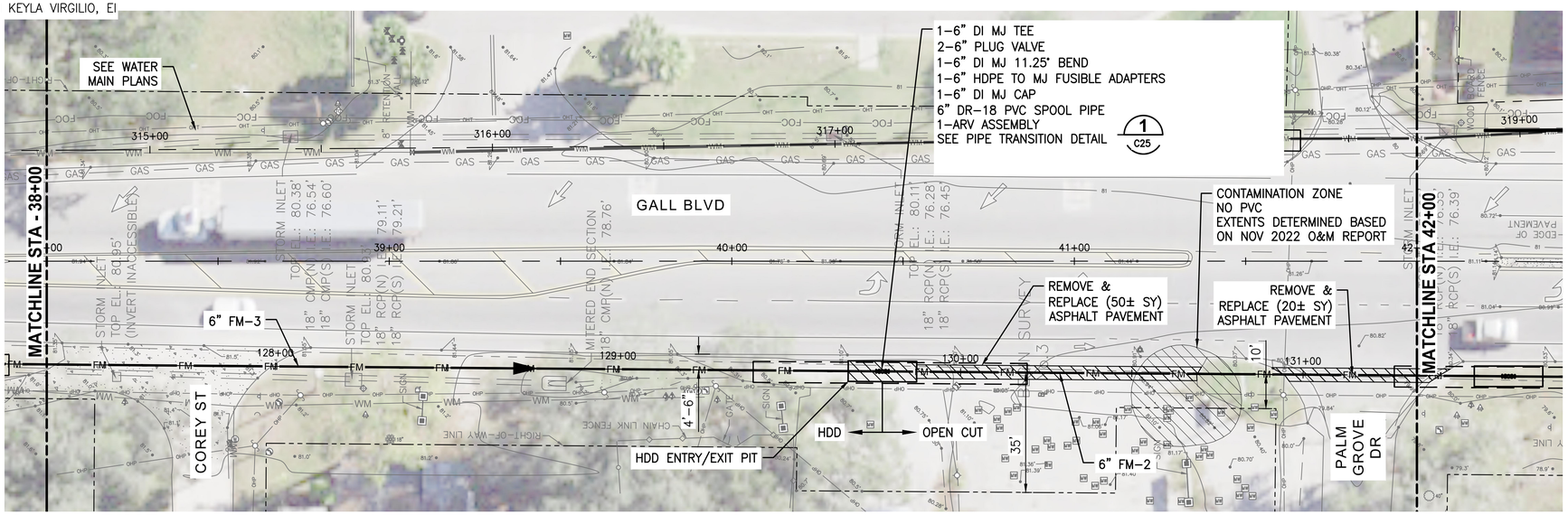
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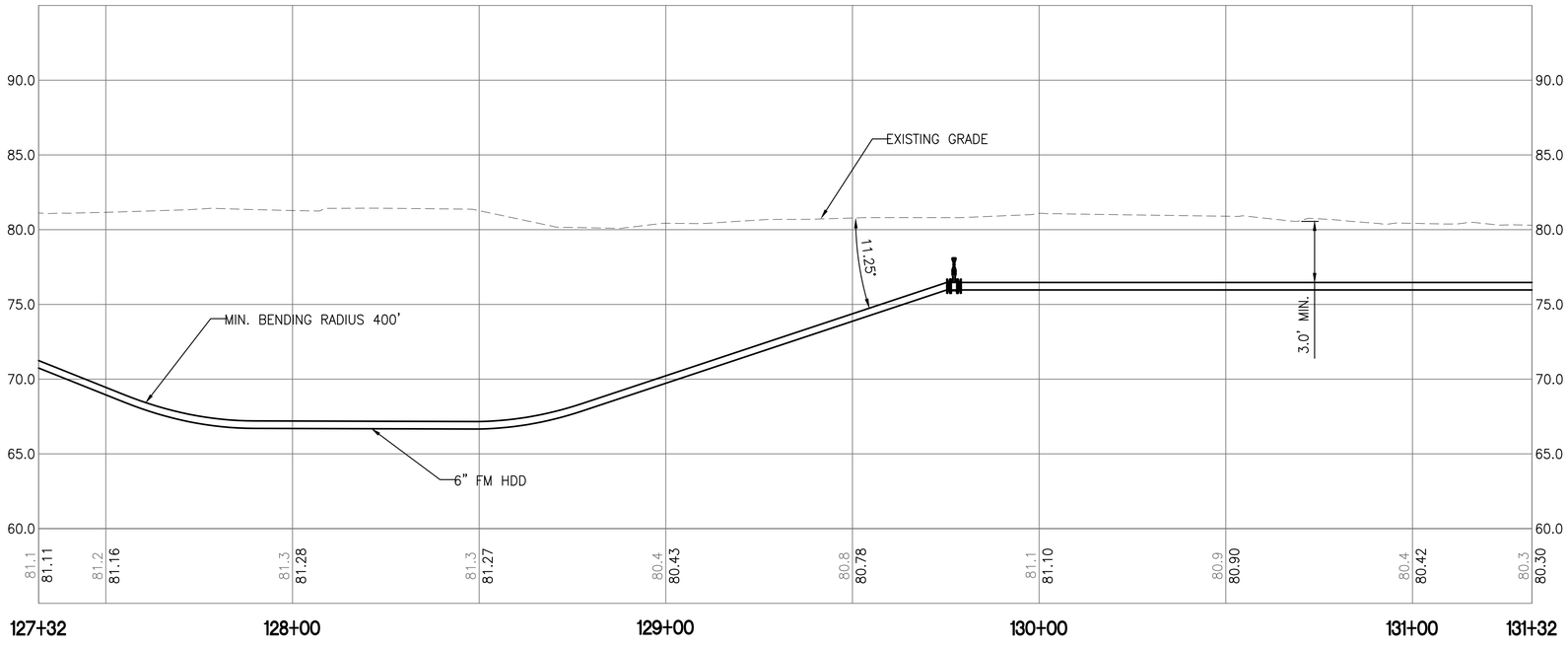
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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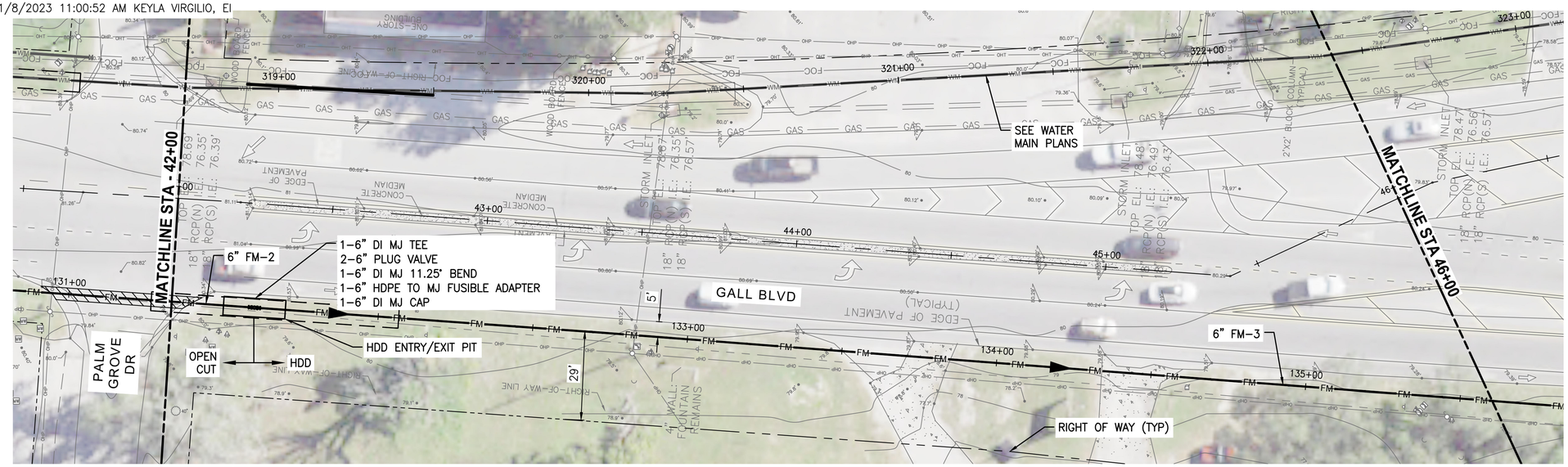
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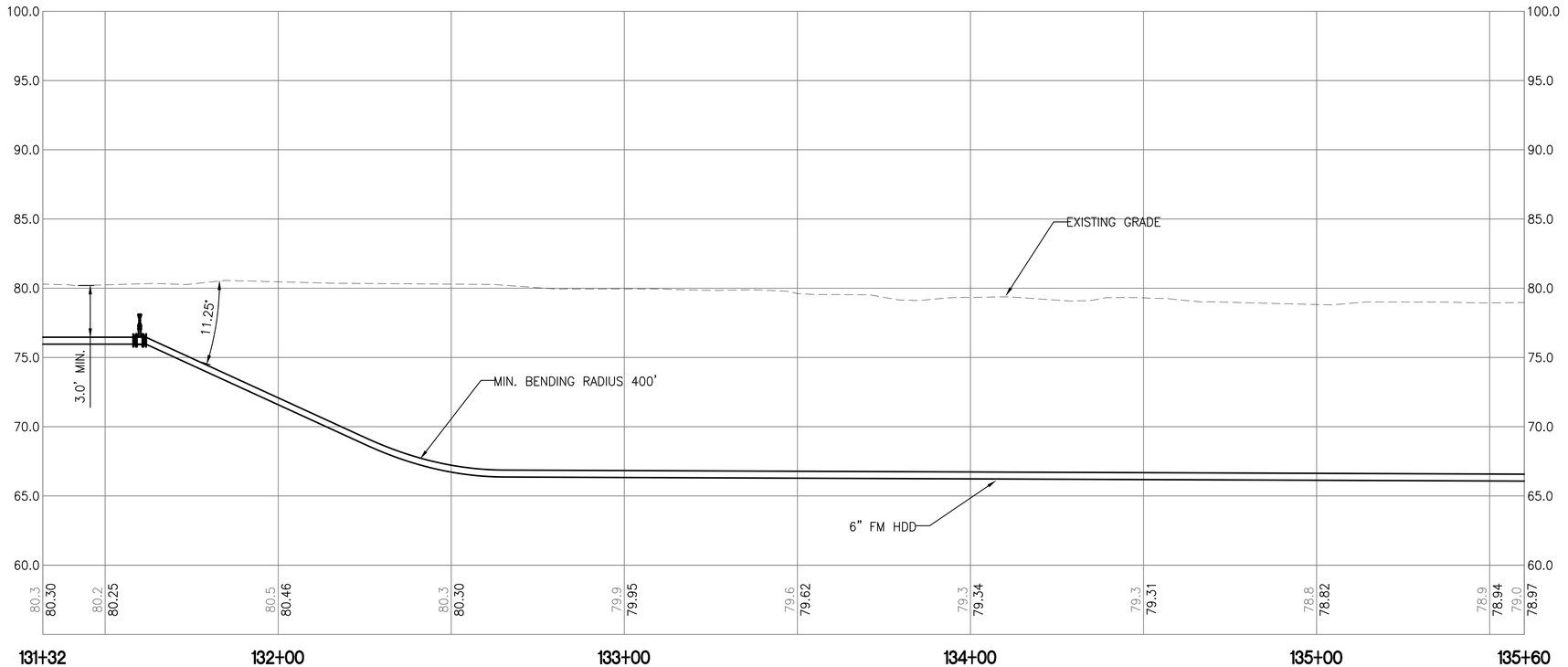
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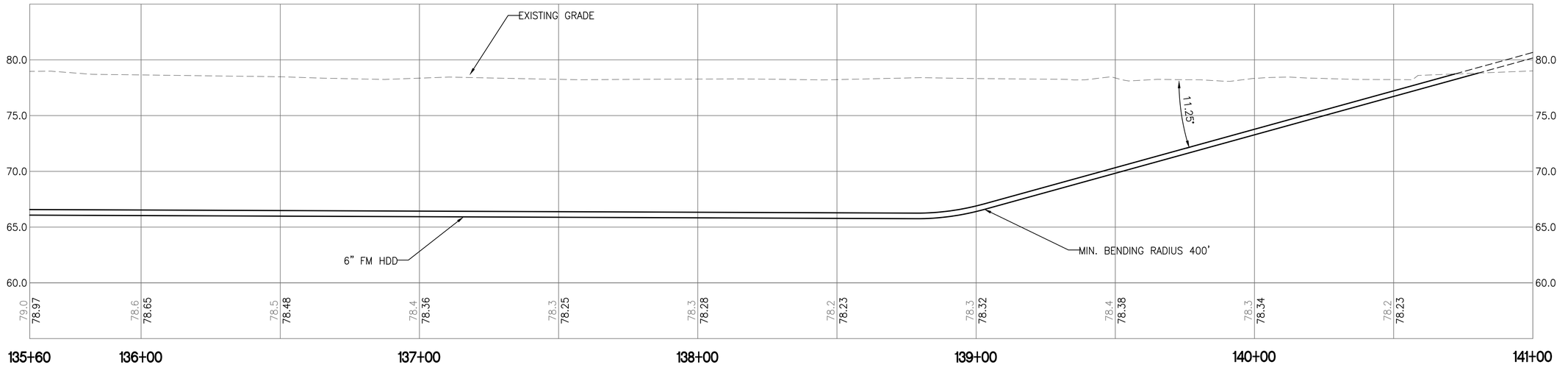
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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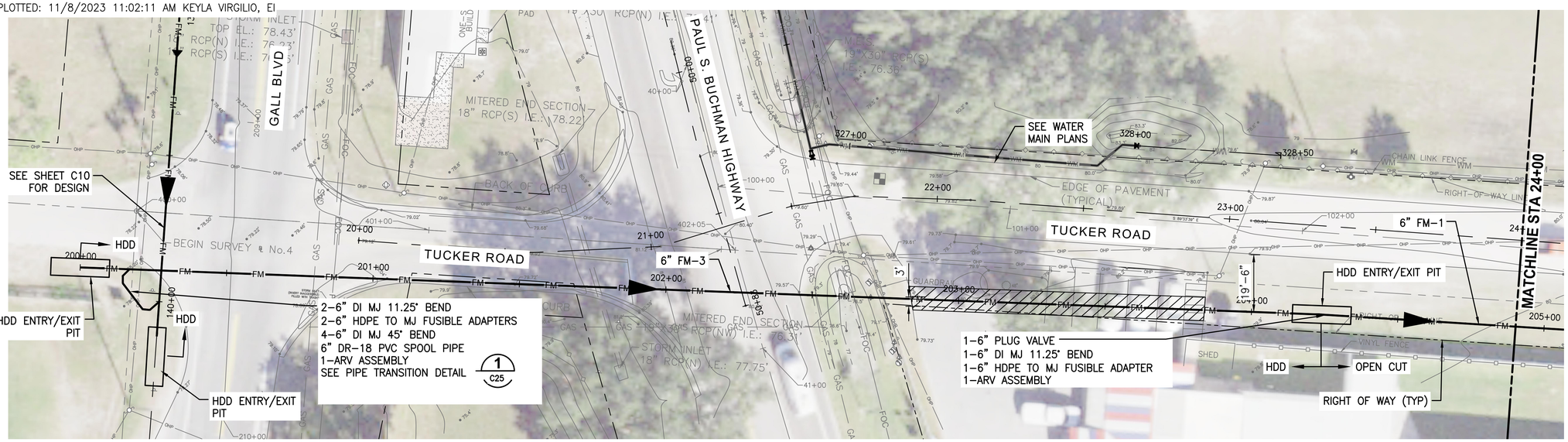
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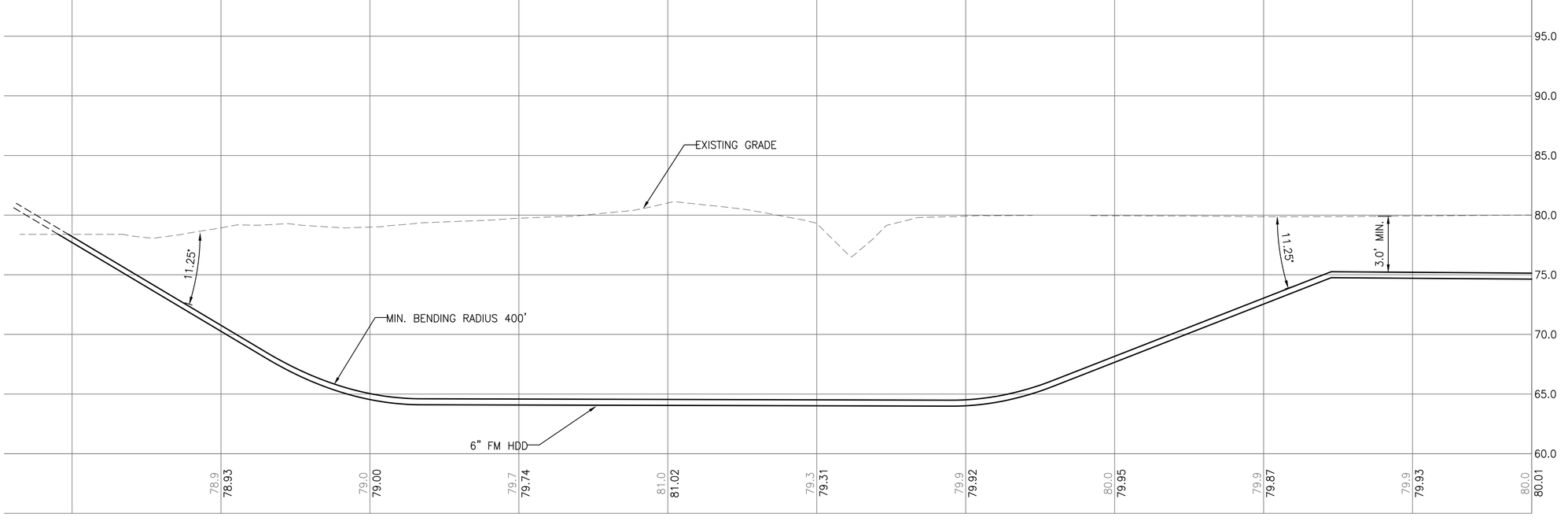
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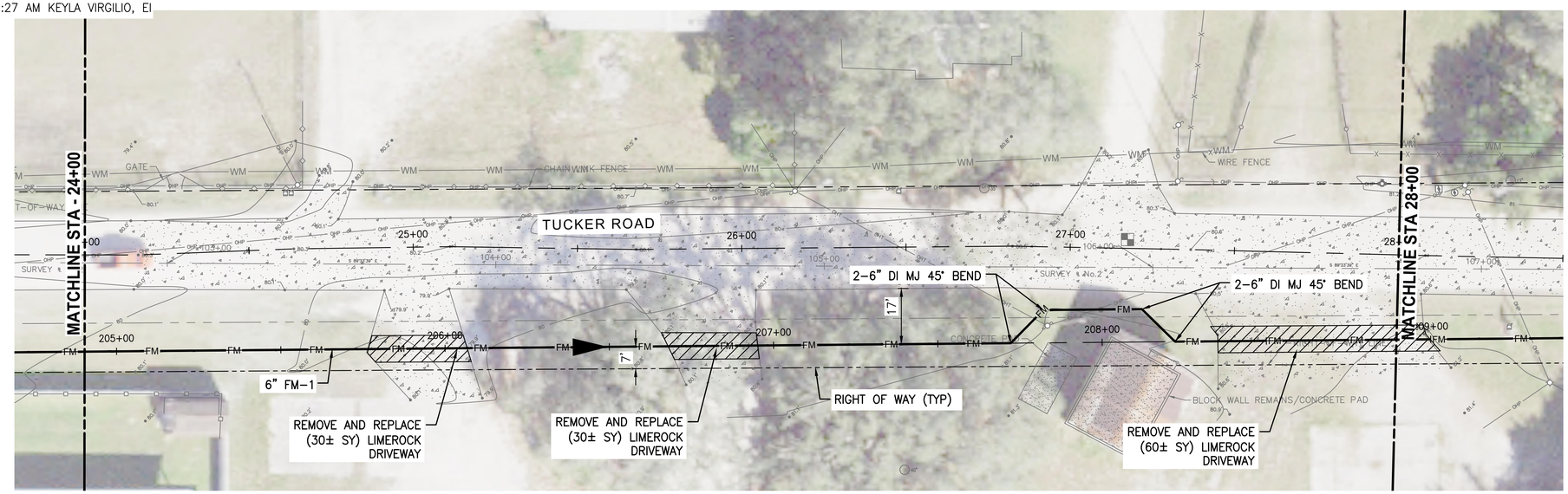
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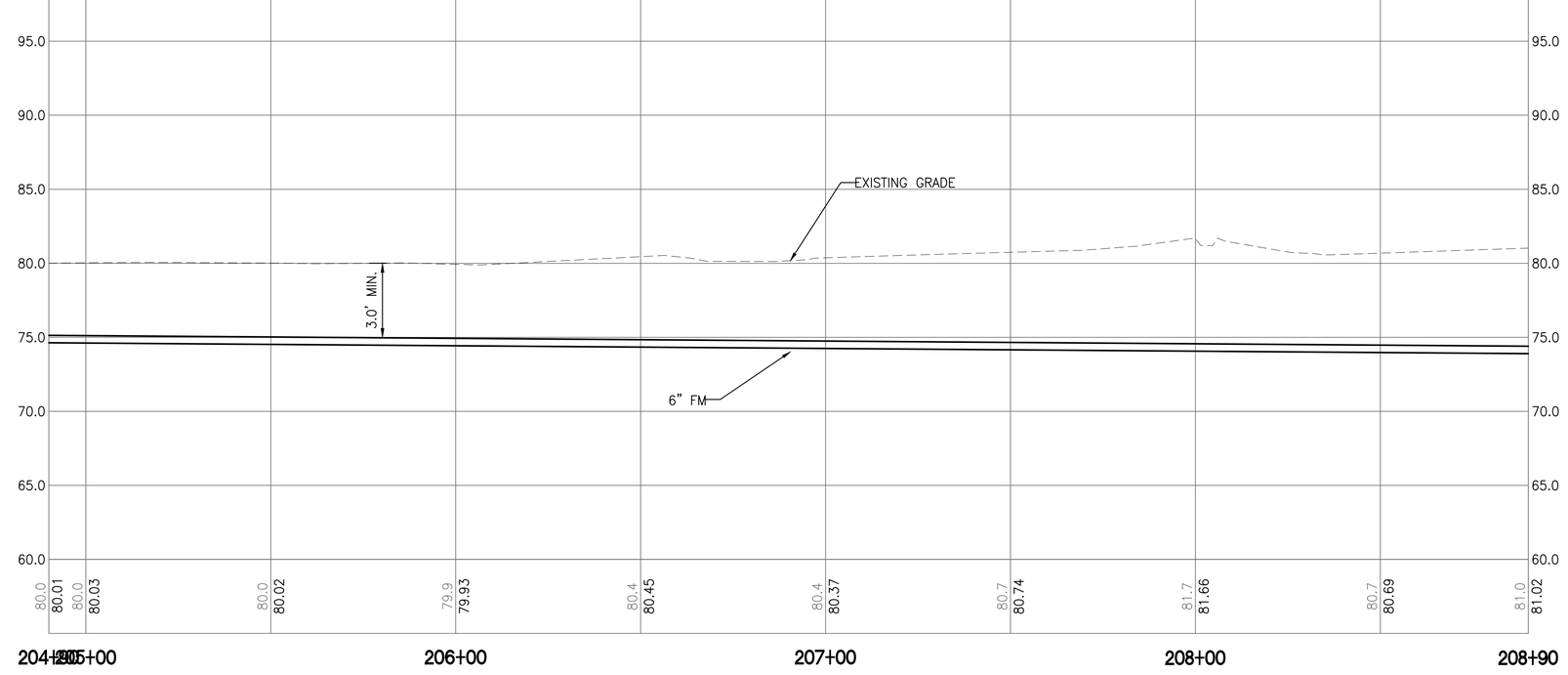
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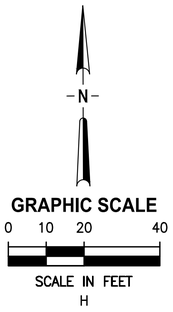
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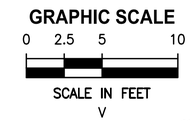
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

FORCEMAIN PLANS

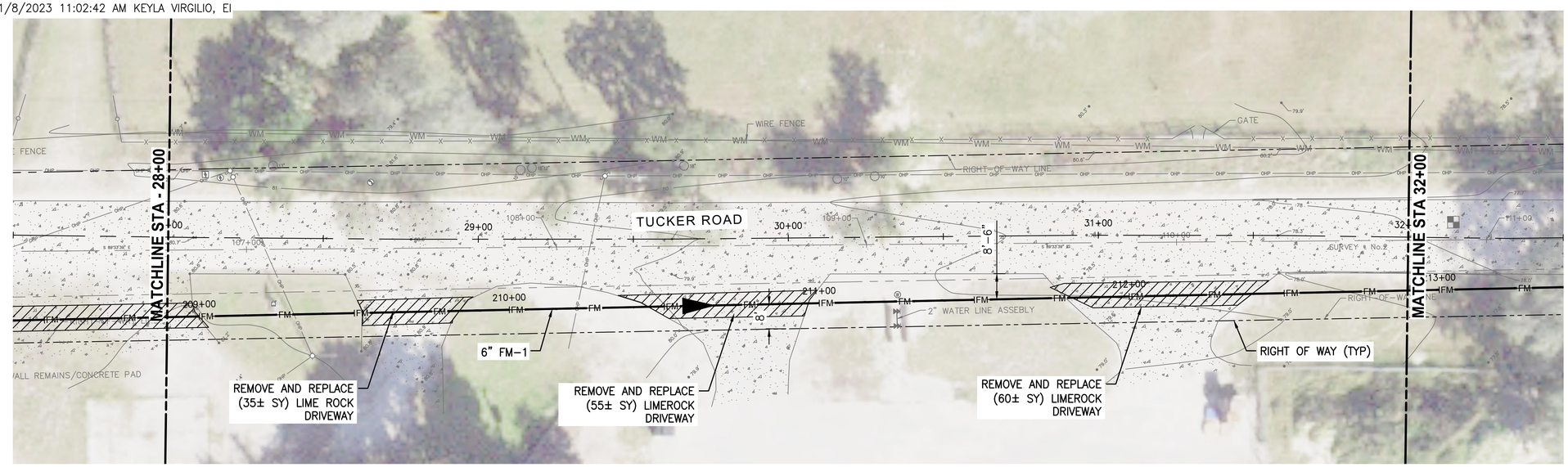
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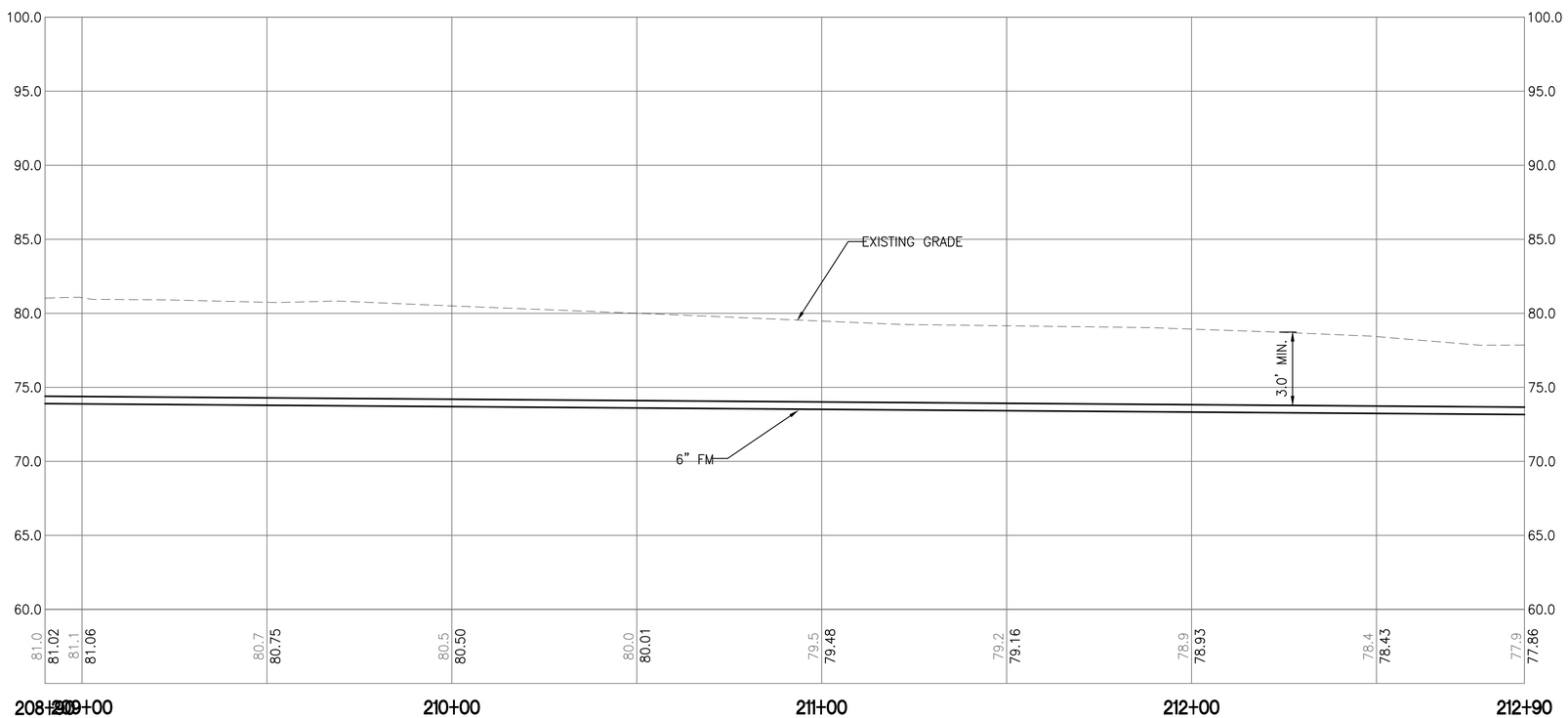
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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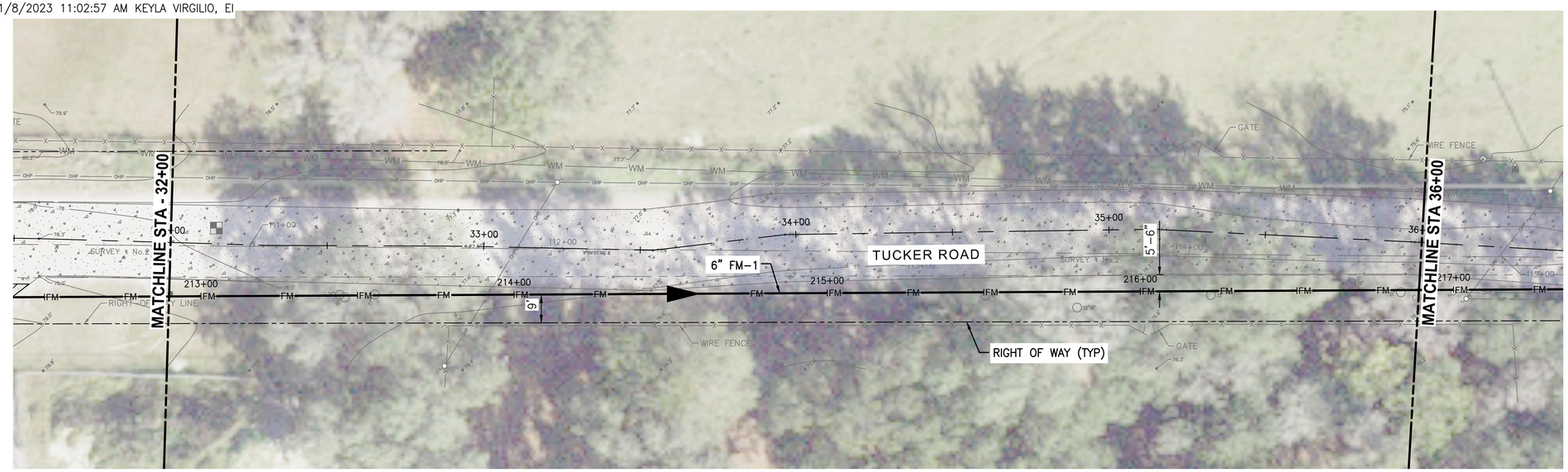
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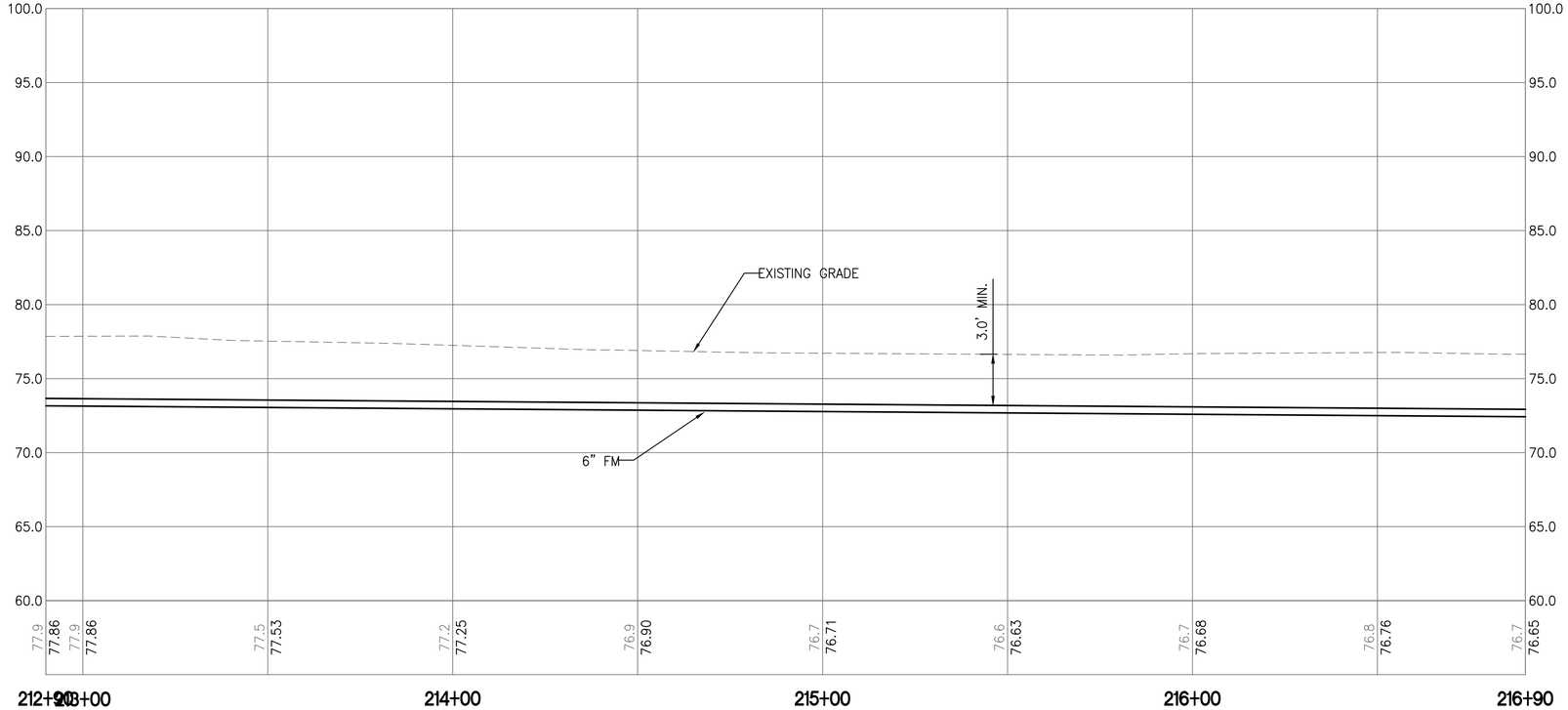
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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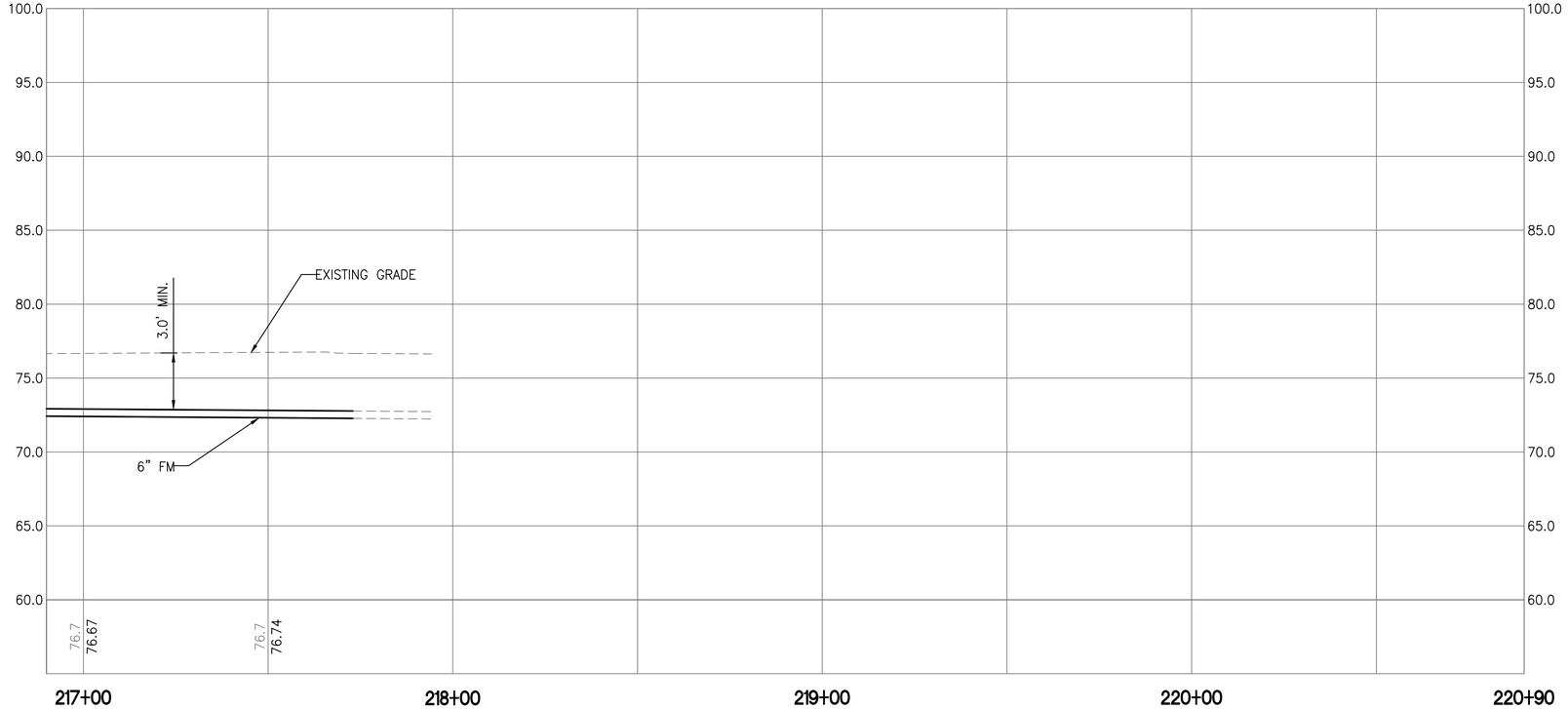
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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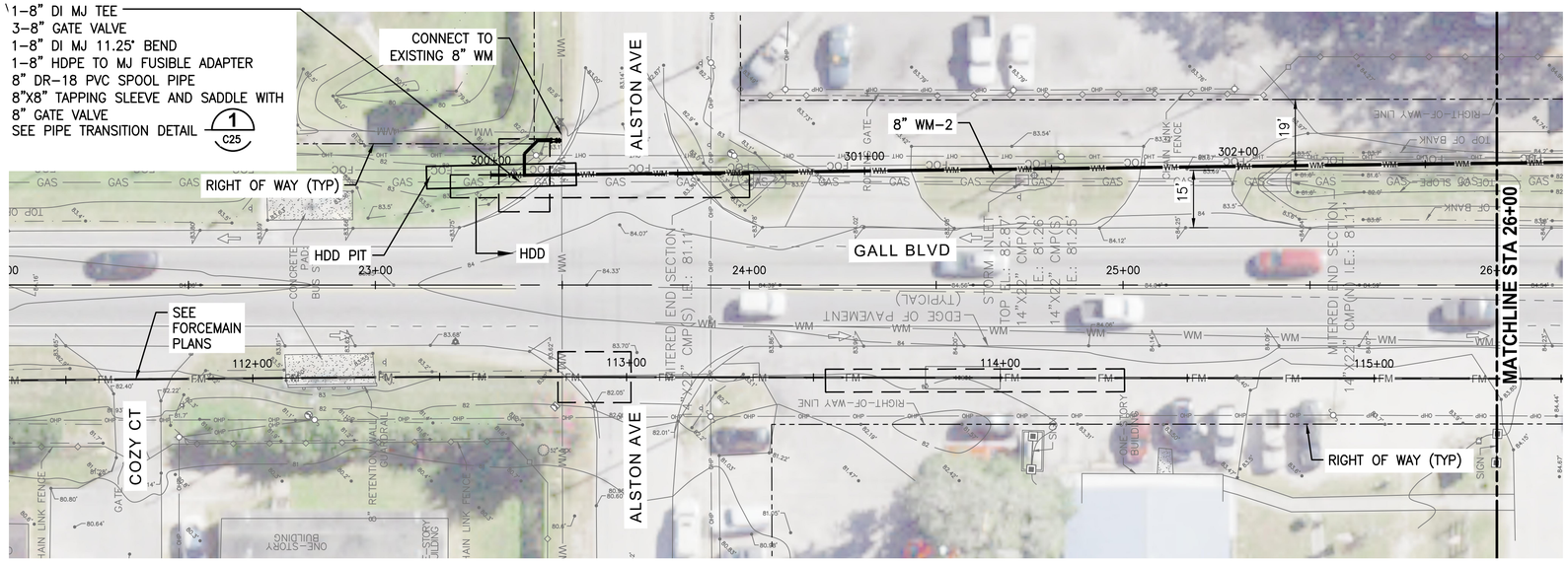
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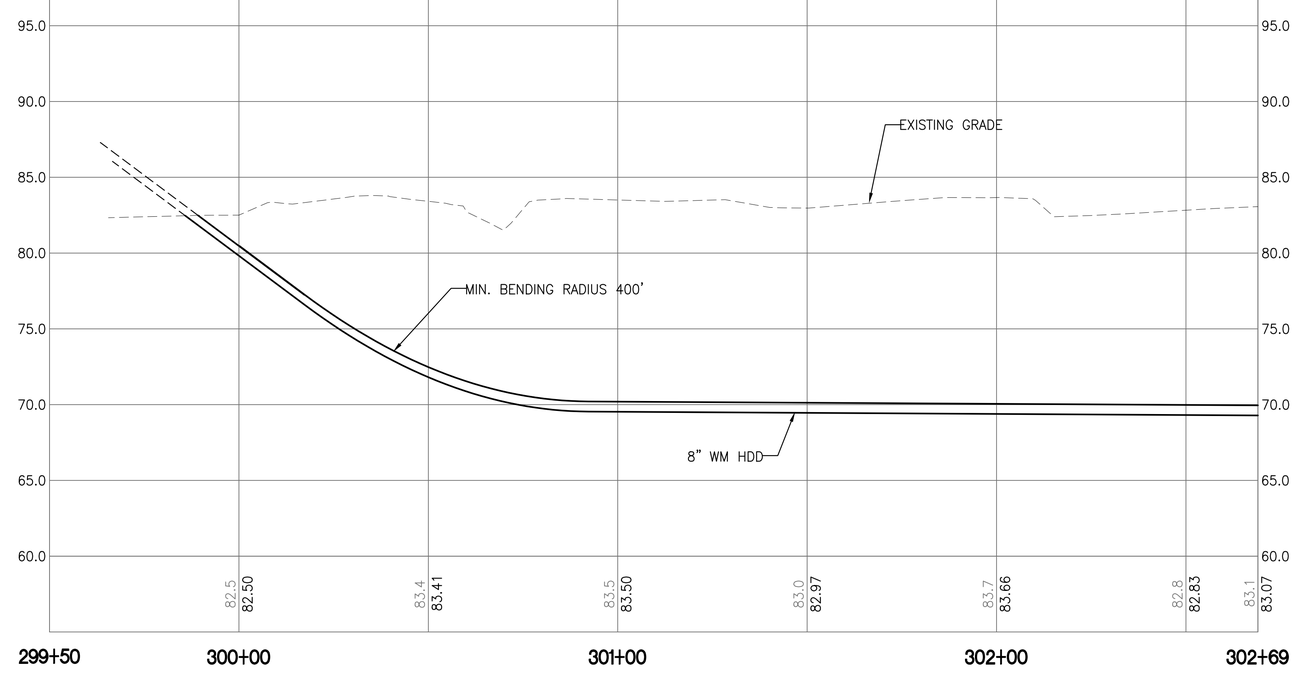
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1–8" DI MJ TEE
3–8" GATE VALVE
1–8" DI MJ 11.25° BEND
1–8" HDPE TO MJ FUSIBLE ADAPTER
8" DR–18 PVC SPOOL PIPE
8"X8" TAPPING SLEEVE AND SADDLE WITH 8" GATE VALVE
SEE PIPE TRANSITION DETAIL (1 / C25)



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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

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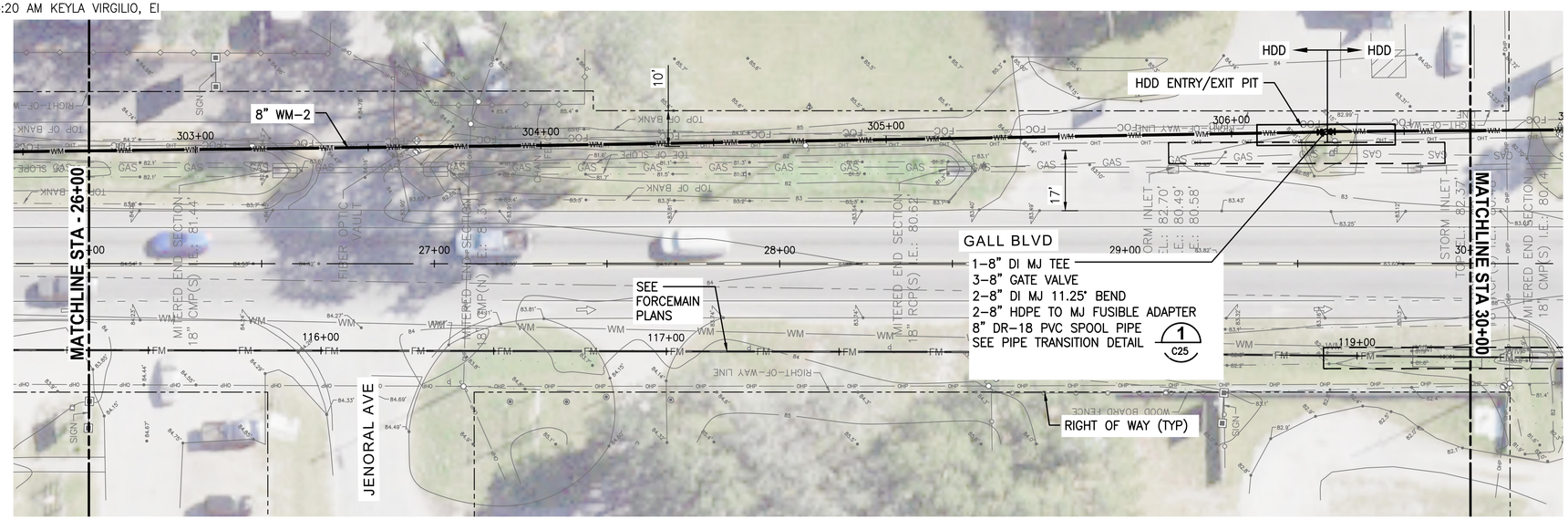
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DWG NO: C16

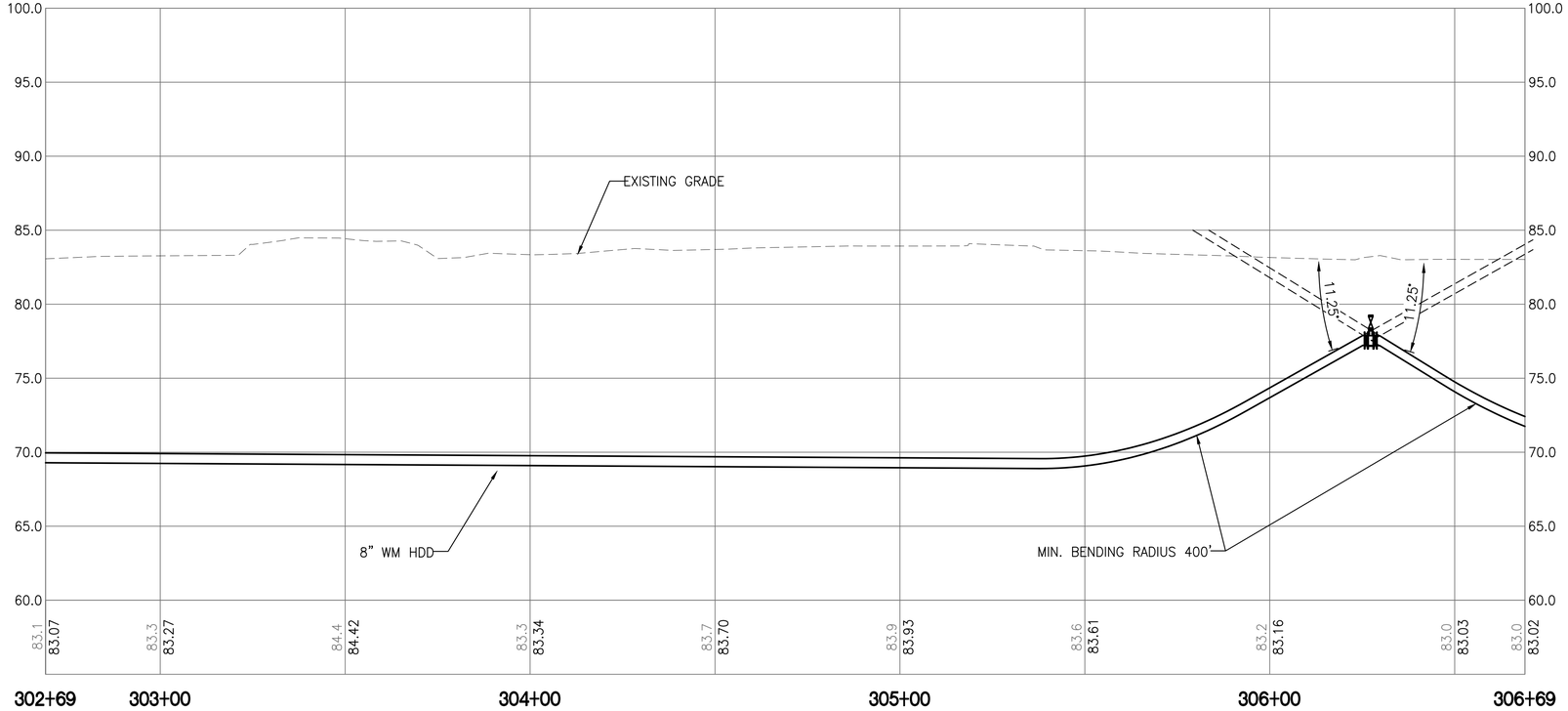
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

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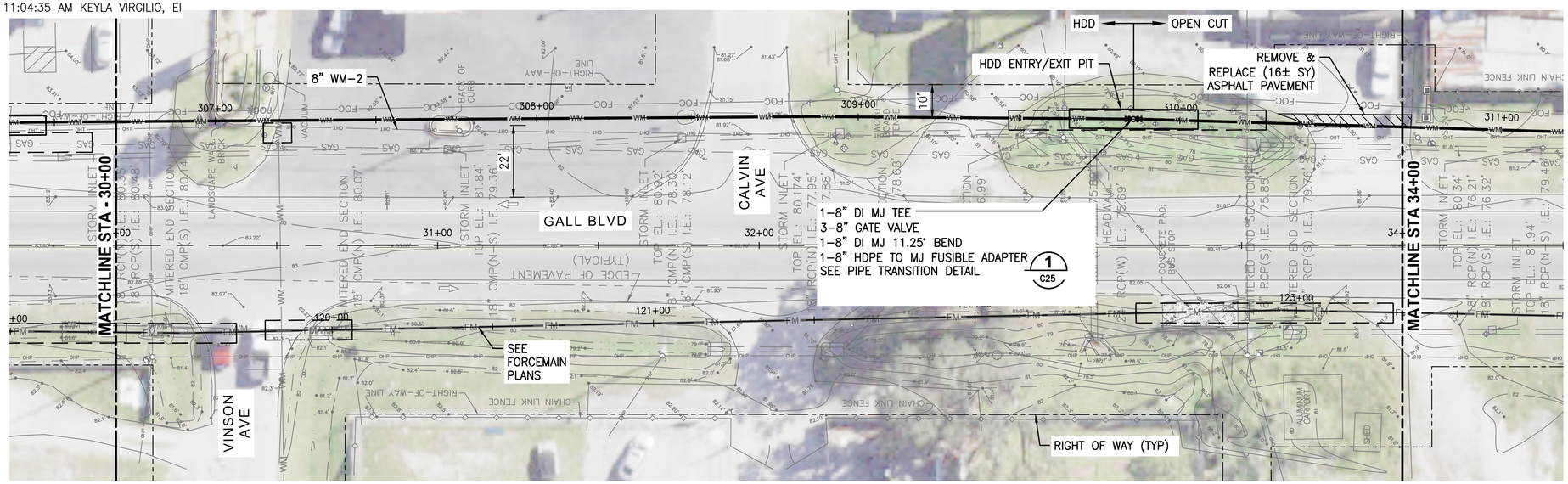
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INDEX NO:	DWG NO: C17

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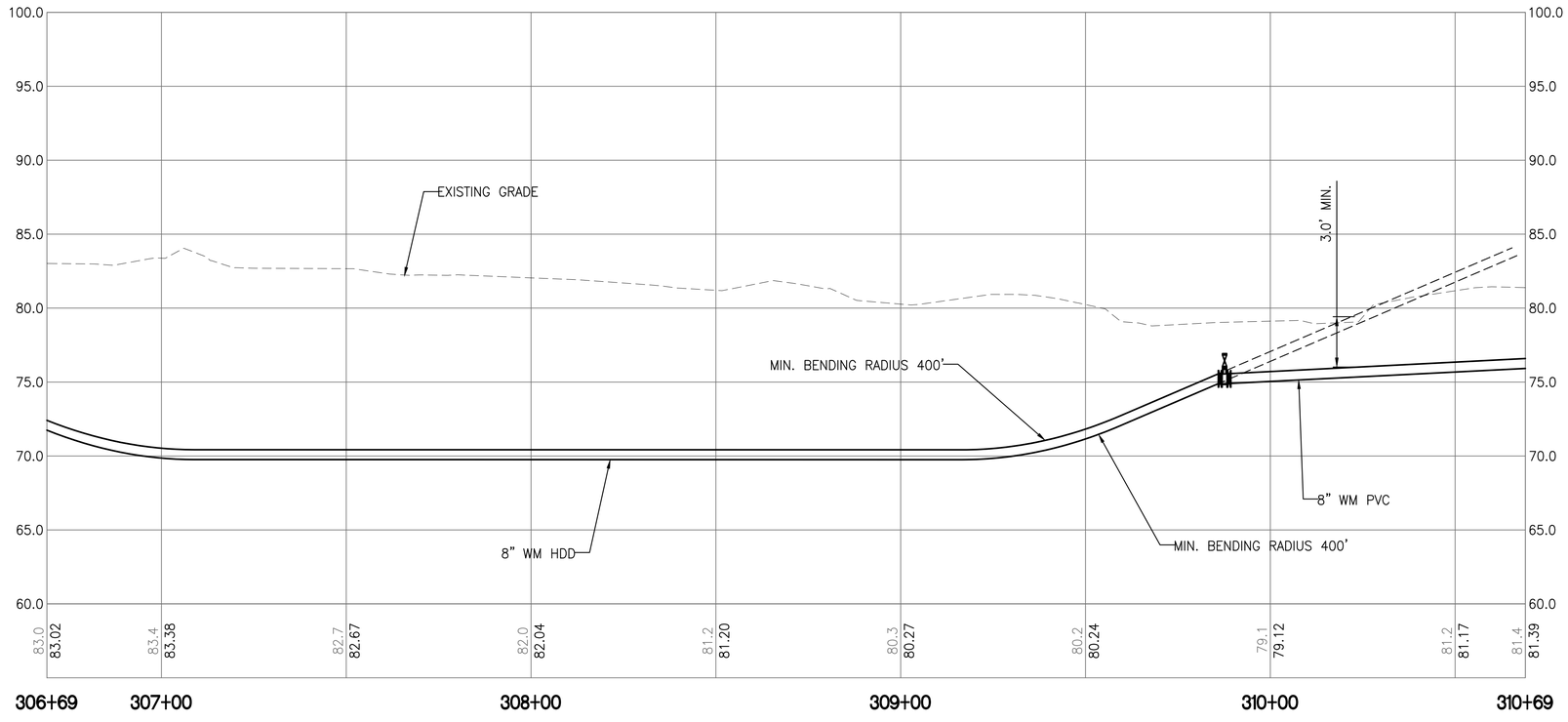
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

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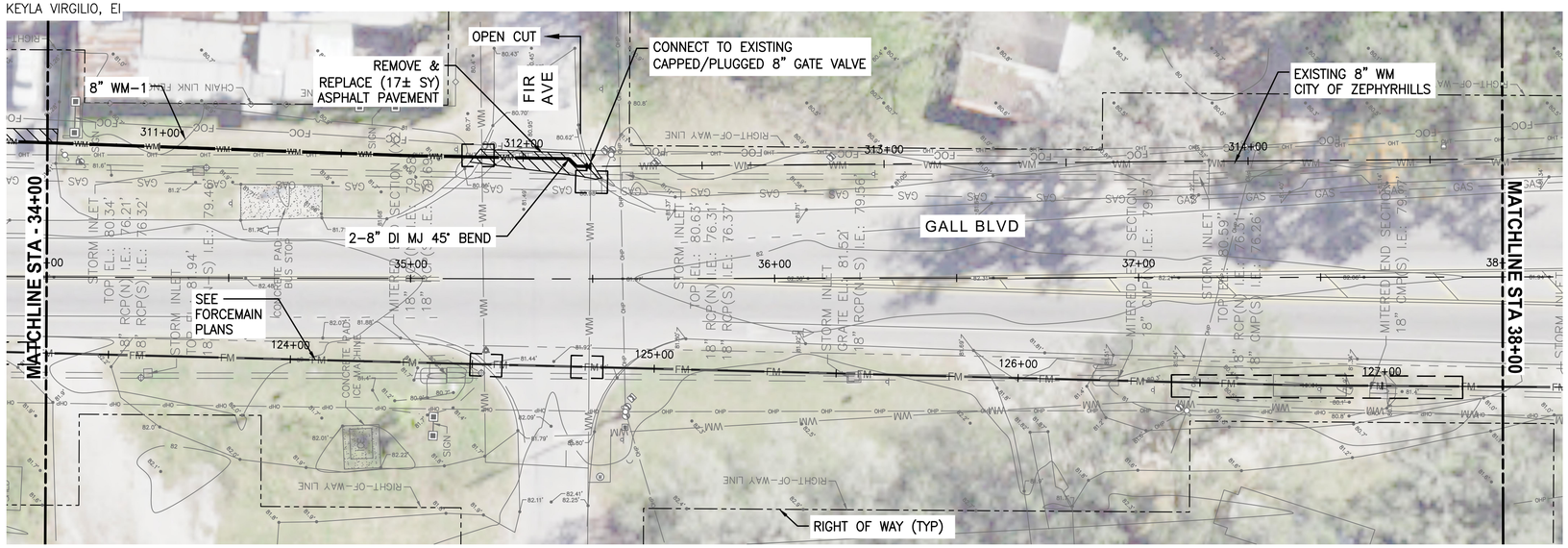
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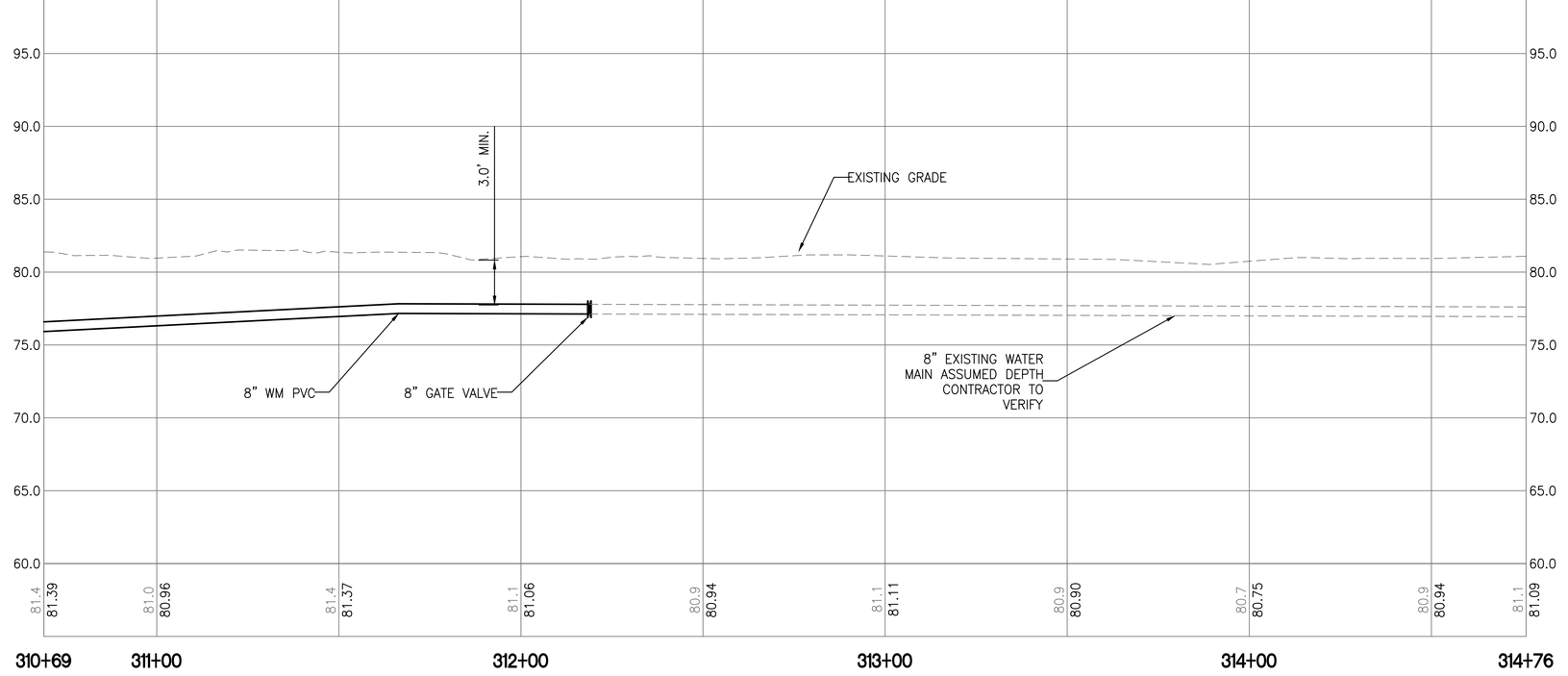
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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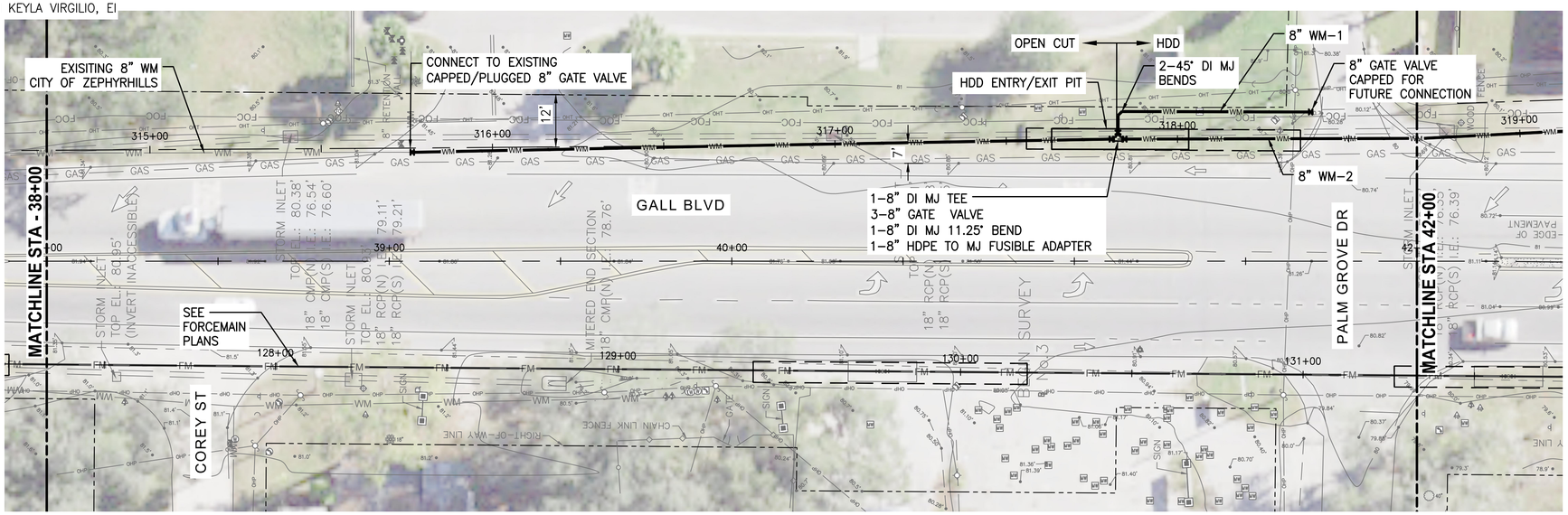
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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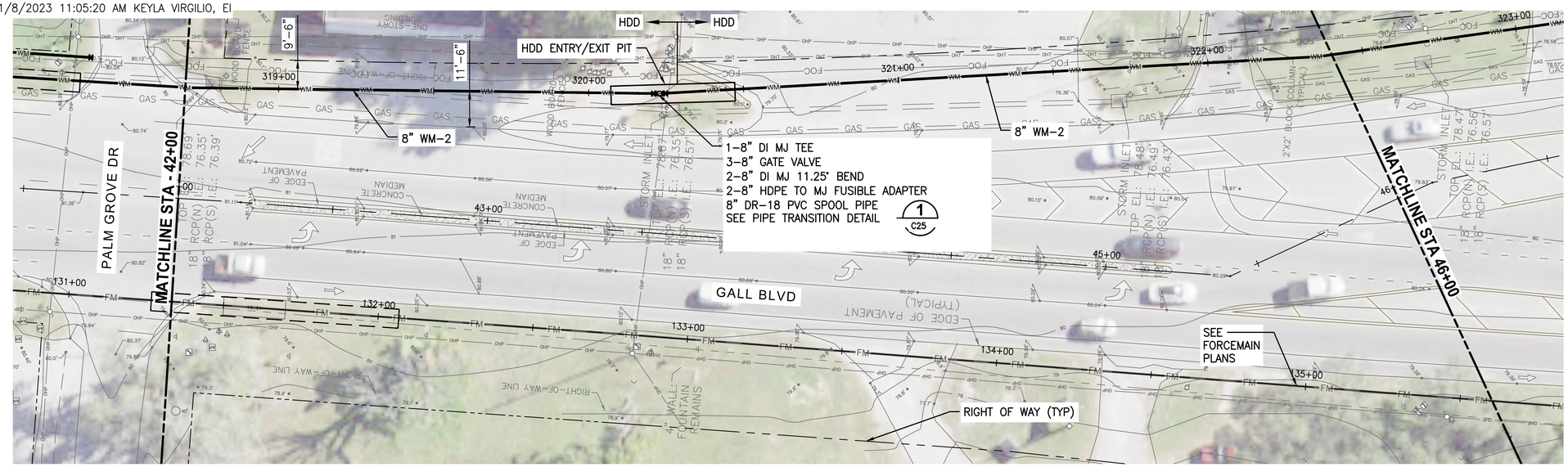
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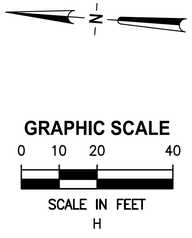
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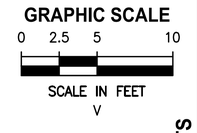
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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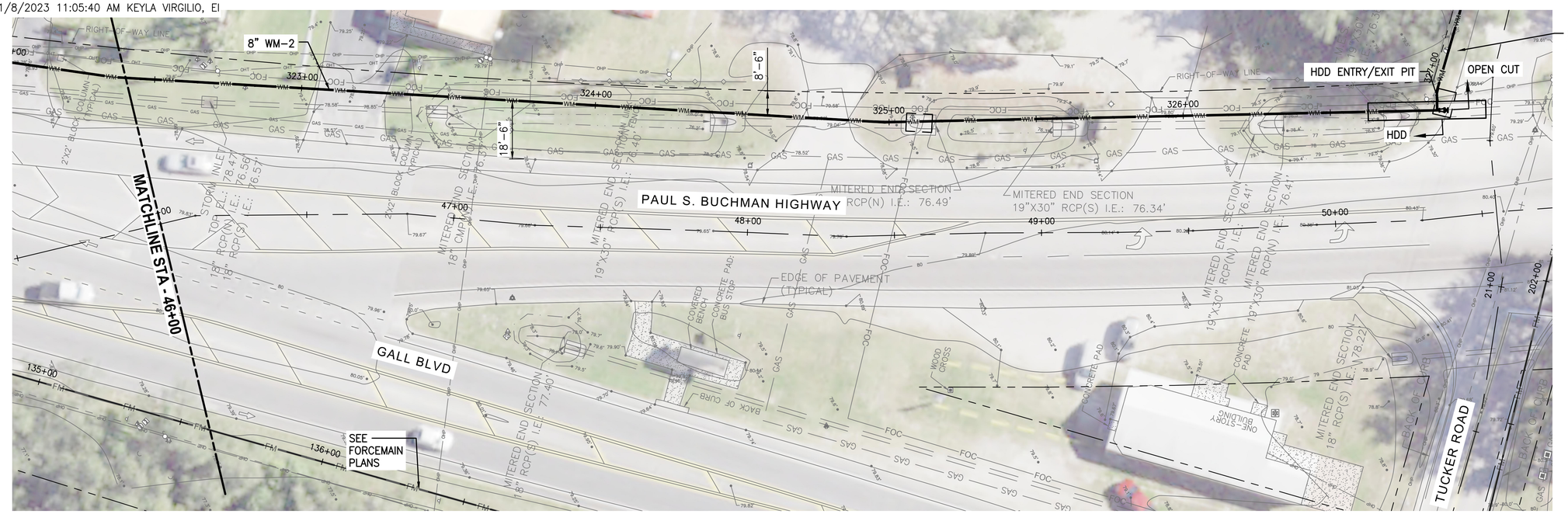
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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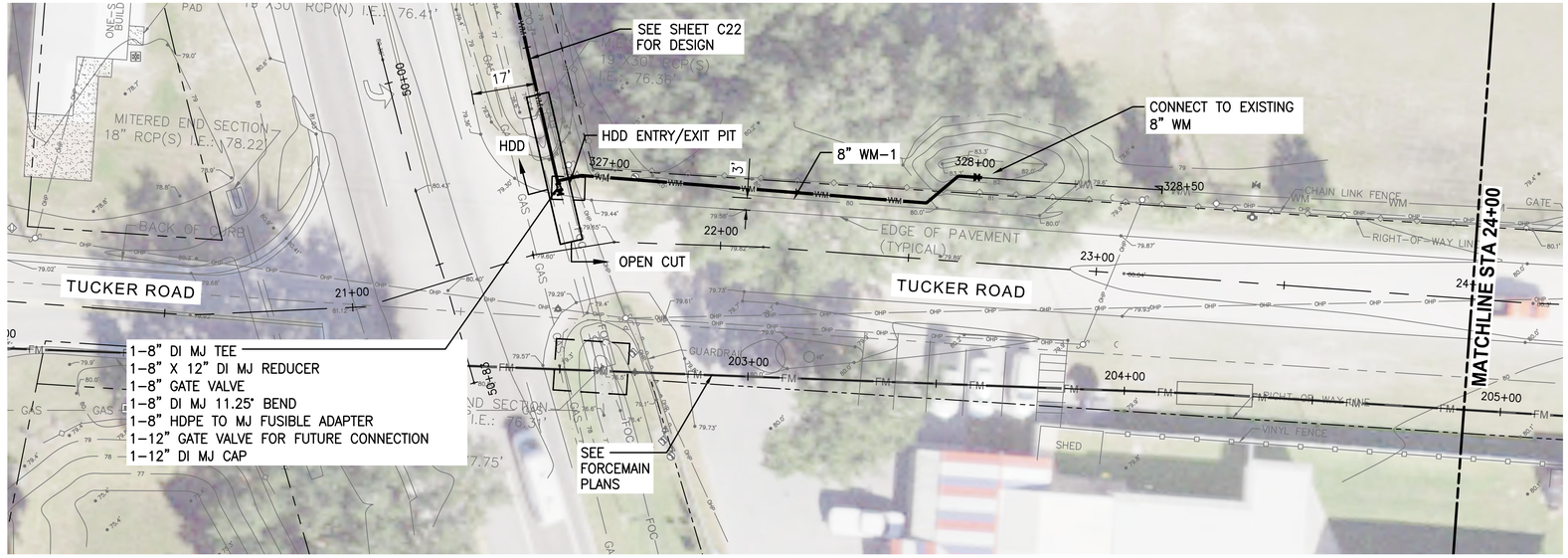
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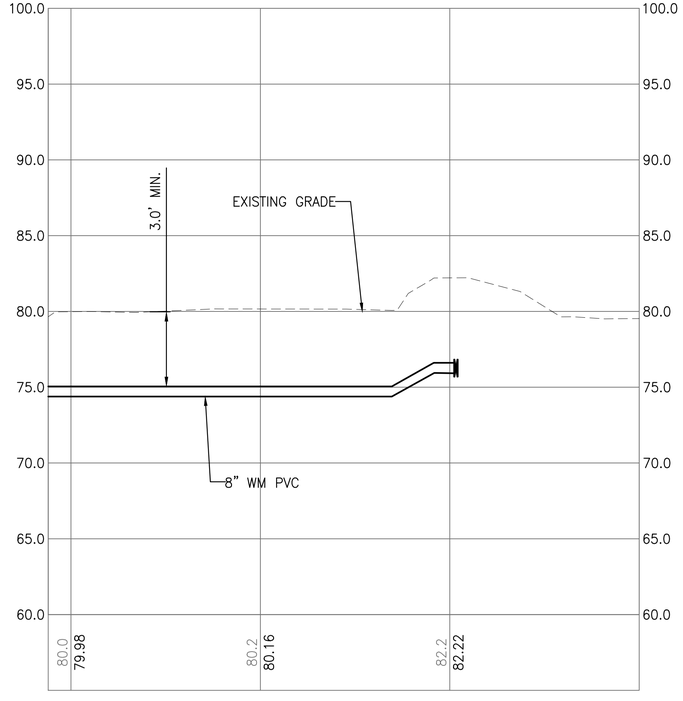
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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

WATERMAIN PLANS

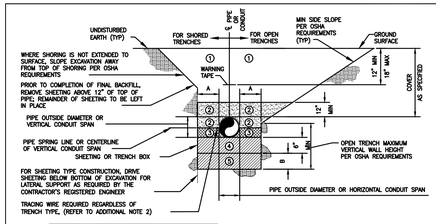
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PROJECT NO:	DATE:
26110-051-01	NOV. 2023
INDEX NO:	DWG NO: C23

SAVED: 9/29/2023 3:23 PM SSIMS Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\051-01 SOUTH 301 W-WW PIPELINES\DESIGN&CONSTRUCTION\CAD\DWGS\CIVIL\26110051101-C16.DWG

PLOTTED: 11/8/2023 11:06:09 AM KEYLA VIRGILIO, EI
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NOMINAL PIPE DIAMETER OR HORIZONTAL CONDUIT SPAN (INCHES)	MINIMUM SIDEWALL CLEARANCE	ADDITIONAL EXCAVATION DEPTH (1)
	A (INCHES)	B (INCHES)
LESS THAN 24	12	12
24 AND GREATER	18	18

(1) REQUIRED WHERE UNSUITABLE MATERIAL IS ENCOUNTERED.

ZONE NO.	ZONE NAME	MATERIAL	COMPACTION
①	FINAL BACKFILL	AS SPECIFIED	AT LEAST 95% MODIFIED PROCTOR MAXIMUM DRY DENSITY ASTM D-1557 (98% WHEN UNDER PAVEMENT)
②	INITIAL BACKFILL		
③	HAUNCHING		
④	BEDDING		
⑤	FOUNDATION		

TRENCH ZONE NOTES:

① FINAL BACKFILL SHALL BE INSTALLED IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. REFER TO ADDITIONAL NOTE 3.

② INITIAL BACKFILL SHALL BE INSTALLED IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HAND TAMPING OR AN APPROVED METHOD OF MECHANICAL TAMPING. REFER TO ADDITIONAL NOTE 3.

③ HAUNCHING SHALL BE IN COMPLETELY DEWATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT. ALL LIFTS SHALL BE COMPACTED BY HAND TAMPING. HAUNCHING SHALL BE BROUGHT UP EQUALLY ON BOTH SIDES OF THE PIPE.

④ BEDDING SHALL BE INSTALLED IN COMPLETELY DEWATERED TRENCHES IN LIFTS NOT EXCEEDING 6 INCHES, LOOSE MEASUREMENT, AND SHALL BE COMPACTED BY HAND OR MECHANICAL TAMPING. PROPERLY SHAPED BELL HOLES SHALL BE EXCAVATED IN THE BEDDING TO PERMIT ASSEMBLY OF THE PIPE. REFER TO ADDITIONAL NOTE 3.

⑤ NATIVE, UNDISTURBED MATERIAL IN COMPLETELY DEWATERED TRENCHES MEETING THE COMPACTION AND MATERIAL REQUIREMENTS FOR COMPACTED BEDDING MATERIAL NEED NOT BE REPLACED OR REWORKED, EXCEPT FOR SHAPING OF THE BELL HOLES, AND WHERE REFILL IS REQUIRED.

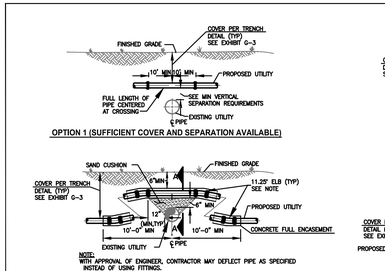
FOUNDATION SHALL BE REQUIRED WHERE UNSUITABLE MATERIAL IS ENCOUNTERED. FOUNDATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS FOR BEDDING. REFER TO ADDITIONAL NOTE 3.

ADDITIONAL NOTES:

1. FOR TRENCHES IN VEHICULAR TRAFFIC AREAS OR BENEATH SURFACE IMPROVEMENTS (EG, SLABS, ASPHALT, ETC.) SEE CONTRACT SPECIFICATIONS FOR ADDITIONAL COMPACTION REQUIREMENTS. SEE DRAWINGS FOR SURFACE IMPROVEMENT AND /OR RESTORATION DETAILS WHERE APPLICABLE.
2. TRACING WIRE SHALL BE INSTALLED ON THE SIDE OF THE PIPE AND ATTACHED TO THE PIPE EVERY 10' W/ A NYLON WIRE TIE. IF THE WIRE IS DAMAGED OR NEEDS TO BE EXTENDED A 3M WATERPROOF TYPE DF SPLICE SHALL BE INSTALLED TO REPAIR THE WIRE. THE ENDS OF THE TRACING WIRE SHALL BE BROUGHT UP IN EVERY VALVE BOX ON THE LINE AND AT THE HYDRANT VALVES. THERE SHALL BE A MINIMUM COIL OF 3' LEFT UNDER THE VALVE BOX COVER. THE WIRE SHALL BE TESTED TO VERIFY CONDUCTIVITY.
3. ALTERNATIVE LIFT THICKNESSES, NOT EXCEEDING 12 INCHES LOOSE MEASUREMENT, ARE ACCEPTABLE IN TRENCH ZONES 1, 2, 4, AND 5 PROVIDED 1) THE LIFT THICKNESS DOES NOT EXCEED THE MAXIMUM VALUE RECOMMENDED IN WRITING BY THE APPLICABLE PIPE MANUFACTURER AND 2) FIELD TEST RESULTS CONFIRM THAT THE SPECIFIED COMPACTION REQUIREMENTS ARE BEING MET.

TYPICAL UTILITY TRENCH DETAIL
NTS

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
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NOVEMBER 2021
G-3



OPTION 1 (SUFFICIENT COVER AND SEPARATION AVAILABLE)

NOTE:
WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

ALTERNATE OPTION 1 (SUFFICIENT COVER OR SEPARATION NOT AVAILABLE)

PROPOSED UTILITY	MINIMUM VERTICAL SEPARATION REQUIREMENTS						
	POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS	COMMENTS
POTABLE WATER	1'-0"	1'-0"(1,2)	1'-0"(1,2)	1'-0"(1)	1'-0"	1'-0"	SEE NOTE 1
GRAVITY SANITARY SEWER	1'-6"(2)	1'-0"	1'-0"	1'-6"	1'-0"(2)	1'-0"	
SEWAGE FORCE MAIN	1'-6"(2)	1'-0"	1'-0"	1'-6"	1'-0"(2)	1'-0"	SEE NOTE 2
STORM	1'-0"(1)	1'-6"	1'-0"	1'-0"	1'-0"	1'-0"	
RECLAIMED WATER	1'-0"	1'-6"	1'-6"	1'-0"	1'-0"	1'-0"	SEE NOTE 2
ELECTRIC TELECOMMUNICATIONS	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	

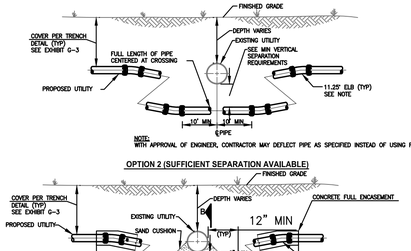
(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

NOTES:
1. ONLY OPTION 1 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.
2. ONLY OPTION 2 CONSTRUCTION IS ALLOWED WITHOUT APPROVAL OF ENGINEER.

PROPOSED UTILITY	MINIMUM HORIZONTAL SEPARATION EXISTING UTILITY					
	POTABLE WATER	GRAVITY SANITARY SEWER	SEWAGE FORCE MAIN	STORM	RECLAIMED WATER	ELECTRIC TELECOMMUNICATIONS
POTABLE WATER	1'-0"	10'-0"(1,2)	10'-0"(1,2)	3'-0"(1)	3'-0"(1,3)	3'-0"
GRAVITY SANITARY SEWER	10'-0"(2)	1'-0"	1'-0"	3'-0"	3'-0"(2)	3'-0"
SEWAGE FORCE MAIN	10'-0"(2)	1'-0"	1'-0"	3'-0"	3'-0"(2)	3'-0"
STORM	3'-0"(1)	3'-0"	3'-0"	1'-0"	3'-0"	3'-0"
RECLAIMED WATER	3'-0"(1,3)	3'-0"(2)	3'-0"(2)	3'-0"	1'-0"	3'-0"
ELECTRIC TELECOMMUNICATIONS	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	2'-0"

(1) FAC 62-555.314
(2) FAC 62-604.400
(3) FAC 62-610.469

NOTE:
UTILITIES SHALL NOT BE INSTALLED WITHIN THE DRIP LINE OF TREES WITHOUT PRIOR WRITTEN APPROVAL FROM THE ENGINEER.

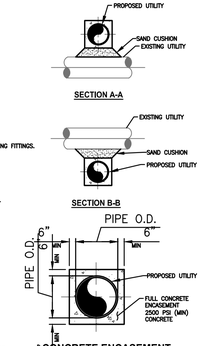


NOTE:
WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

OPTION 2 (SUFFICIENT SEPARATION AVAILABLE)

NOTES:
1. FOR PROPOSED WATER MAINS, THIS OPTION IS ONLY ALLOWED WITH APPROVAL OF THE ENGINEER AND FDEP ON A CASE BY CASE BASIS.
2. WITH APPROVAL OF ENGINEER, CONTRACTOR MAY DEFLECT PIPE AS SPECIFIED INSTEAD OF USING FITTINGS.

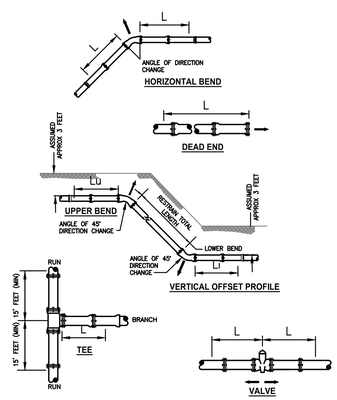
ALTERNATE OPTION 2 (SUFFICIENT SEPARATION NOT AVAILABLE)



UTILITY CONFLICT

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
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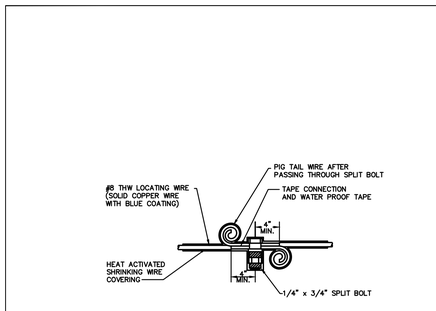
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NOMINAL SIZE	VALVES OR DEAD-ENDS	HORIZONTAL BENDS			VERTICAL OFFSET		TEES			REDUCERS	
		90° BENDS	45° BENDS	22.5° BENDS	11.25° BENDS		RUN SIZE	BRANCH SIZE	L (FT)	RUN SIZE	L (FT)
					Lu	LI					
10	84	37	16	85	4	35	16	10	≤10	27	12 TO 10	29
12	99	43	18	9	5	41	18	12	≤12	41		

NOTES:
1. THE SCHEDULE SHOWN IS FOR THE FOLLOWING SERVICE CONDITIONS: 150 PSIG; SPECIFIED TRENCH ZONE MATERIAL; 36 INCHES COVER; TYPE 3 LAYING CONDITIONS; AND 1.5 SAFETY FACTOR.
2. RESTRAINED LENGTHS SHOWN IN TABLE ARE IN FEET AND ARE MINIMUM LENGTHS REQUIRED IN EACH DIRECTION FROM FITTING OR VALVES.
3. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION REGARDING RESTRAINED JOINTS.
4. ALL PIPE SHALL BE RESTRAINED TO THE NEXT JOINT BEYOND THE RESTRAINED LENGTH GIVEN.
5. EACH SIDE OF HDPE TRANSITION FITTINGS SHALL BE RESTRAINED PER THE RESTRAINED JOINT SCHEDULE AS AN IN-LINE VALVE.

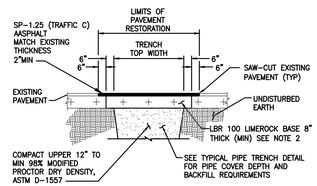
TYPICAL RESTRAINED JOINT DETAIL
NTS



NOTES:
1. THE ENDS OF ALL LOCATING WIRES, WHETHER THEY ARE SPLICED, CONNECTED, OR TERMINATED, SHALL HAVE THE LAST THREE INCHES PIG TAILED AS DETAILED HEREON.
2. AFTER INSTALLATION OF THE LOCATING WIRE THE SYSTEM SHALL BE SUBJECTED TO TESTING, IN THE PRESENCE OF CITY UTILITIES STAFF PRIOR TO BACKFILL, IN ORDER TO THAT THE SYSTEM IS FUNCTIONAL.

LOCATING WIRE SPLICING
NOT TO SCALE

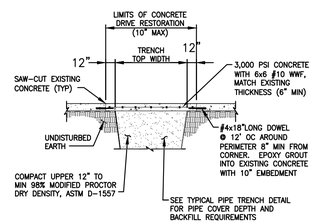
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NOVEMBER 2021
G-8



NOTES:
1. ASPHALT PAVEMENT RESTORATION DETAIL APPLIES TO CITY ROADS, DRIVEWAYS, PRIVATE ROADS, DRIVES, MISCELLANEOUS PATCHES, AND SIMILAR RESTORATION.
2. NEW LIMEROCK TO BE COMPACTED TO NOT LESS THAN 98% MODIFIED PROCTOR DRY DENSITY, ASTMD-1557.
3. FOR COUNTY ROADS AND STATE ROADS, DESIGN SHALL BE IN COMPLIANCE WITH PASCO COUNTY STANDARDS AND FDOT STANDARDS RESPECTFULLY.

ASPHALT PAVEMENT RESTORATION
NTS

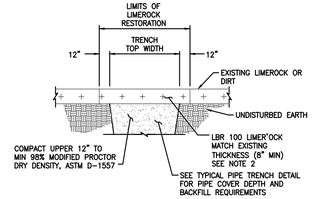
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NOTES:
MATCH EXISTING GRADE AND FINISH.

CONCRETE DRIVE RESTORATION
NTS

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G-9A



NOTES:
1. LIMEROCK PAVEMENT RESTORATION DETAIL APPLIES TO COUNTY ROADS, DRIVEWAYS, PRIVATE ROADS, DRIVES, MISCELLANEOUS PATCHES, AND SIMILAR RESTORATION.
2. NEW LIMEROCK TO BE COMPACTED TO NOT LESS THAN 98% MODIFIED PROCTOR DRY DENSITY, ASTMD-1557.

LIMEROCK RESTORATION
NTS

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G-9B

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

CIVIL DETAILS

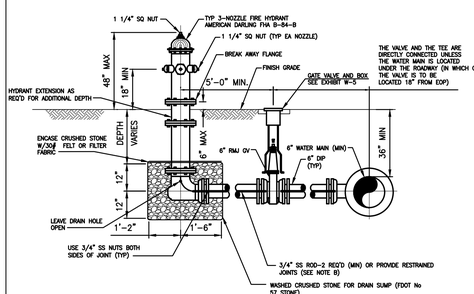
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PROJECT NO: 26110-051-01
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DWG NO: C24

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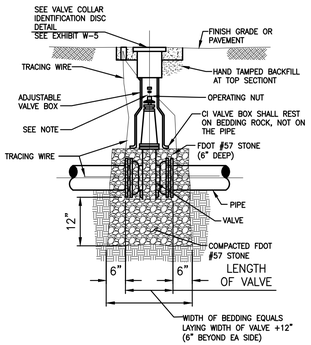
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NOTES:
A. FIRE HYDRANT INSTALLATION SHALL BE IN ACCORDANCE WITH THE CITY'S LAND DEVELOPMENT CODE.
B. 3/4" STAINLESS STEEL ROD CUT AND THREADED AS REQUIRED, OR PROVIDE RESTRAINED JOINTS.
C. FIRE HYDRANTS SHALL BE INSTALLED BETWEEN 3' AND 7' FROM EDGE OF PAVEMENT.
D. TIE RODS, NUTS, WASHERS AND OTHER FASTENERS SHALL BE GALVANIZED OR TYPE 316 STAINLESS STEEL.
E. 4 1/2" PUMPER NOZZLE TO BE PERPENDICULAR TO CENTERLINE OF MAJOR STREET.
F. FIRE HYDRANT ASSEMBLY INCLUDES ALL THAT IS SHOWN INCLUDING DI PIPE TO R/W, DIP TEE AT MAIN, HYDRANT, REDUCERS, VALVE, HYDRANT EXTENSIONS, VALVE EXTENSIONS, ALL PIPING AND MISCELLANEOUS APPURTENANCES REQUIRED FOR A COMPLETE INSTALLATION.
G. FOR FIRE HYDRANTS ALONG PAVED ROADWAYS, INSTALL RAISED PAVEMENT MARKER FOR FIRE HYDRANT IDENTIFICATION. MARKER SHALL BE BLUE AND IN ACCORDANCE WITH FDOT 706. MARKER SHALL BE LOCATED IN THE CENTER OF CLOSEST LANE PERPENDICULAR TO FIRE HYDRANT.

FIRE HYDRANT DETAIL
NTS

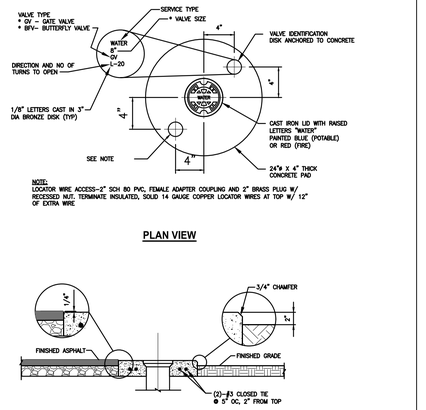
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NOVEMBER 2021
W-10



NOTES:
1. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.
2. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.

GATE VALVE BOX
NTS

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W-3

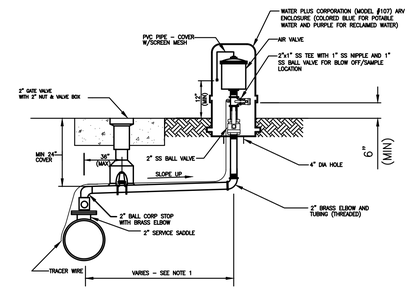


NOTE:
LOCATOR WIRE ACCESS-2" SCH 80 PVC, FEMALE ADAPTER COUPLING AND 2" BRASS PLUG W/ RECESSED NUT. TERMINATE INSULATED, SOLID 14 GAUGE COPPER LOCATOR WIRES AT TOP W/ 12" OF EXTRA WIRE

PLAN VIEW

VALVE COLLAR AND IDENTIFICATION DISK
NTS

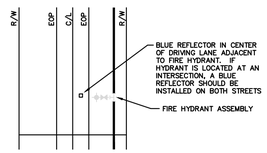
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NOVEMBER 2021
W-5



NOTES:
1. OFFSET DISTANCE SHOWN ON DRAWINGS.
2. ADJUST HORIZONTAL LOCATION OF ARV ENCLOSURE, AS REQUIRED TO AVOID SIDEWALK. LOCATE ARV ENCLOSURE WITHIN 1' OF R/W OR AS OTHERWISE DETERMINED BY THE CITY.

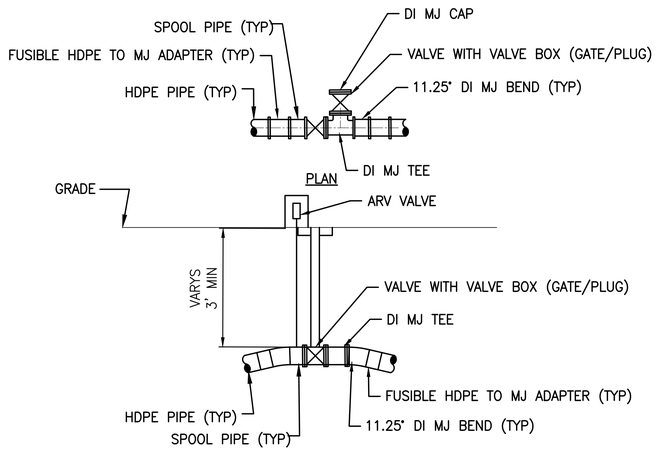
OFFSET AIR VALVE DETAIL
NTS

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CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
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NOVEMBER 2021
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FIRE HYDRANT REFLECTOR DETAIL
NOT TO SCALE

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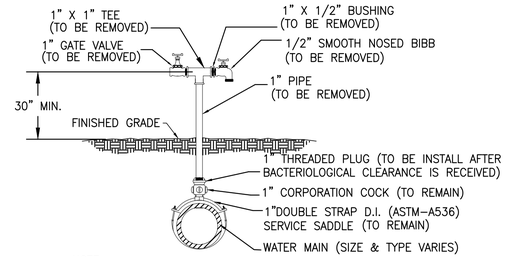


SECTION

PIPE TRANSITION DETAIL
NTS

1

NOTES:
(1) ALL CONNECTIONS SHALL BE RESTRAINED.
(2) FITTING CALLOUTS AS SHOWN IN DETAIL ARE FOR CONCEPTUAL PURPOSES. SEE PLANS FOR SPECIFIC FITTING AND PIPE CALLOUTS AT PIPE TRANSITIONS AND OTHER LOCATIONS.



NOTE:
1) LOCATION OF SAMPLE POINT BIBB SHALL NOT BE WITHIN THE ROADWAY BUT ROUTED TO THE ROADWAY SHOULDERS (NON-TRAFFIC AREAS) OF THE ROAD (WHERE APPLICABLE)
2) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL PIPING & FITTINGS NOTED AFTER BACTERIOLOGICAL CLEARANCE IS RECEIVED FROM THE HEALTH DEPARTMENT.

1" BACTERIOLOGICAL SAMPLE POINT DETAIL
N.T.S.

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BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

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730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

CIVIL DETAILS

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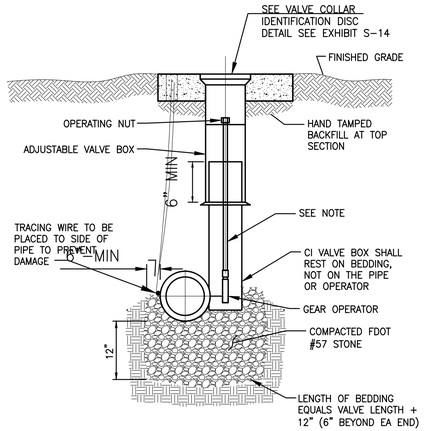
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PROJECT NO: 26110-051-01
DATE: NOV. 2023
INDEX NO:
DWG NO: C25

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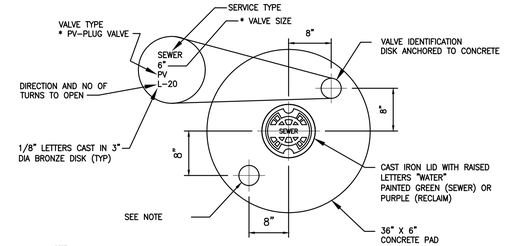
NOTES:
1. VALVE STEM EXTENSION(S) REQ'D TO MAINTAIN 2' DEPTH TO OPERATING NUT ON DEPRESSED MAIN W/36" OR MORE COVER.
2. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.

PLUG VALVE
NTS

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613

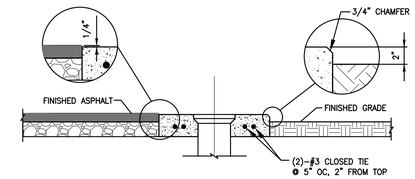
NOVEMBER 2021

S-12



NOTE:
LOCATOR WIRE ACCESS-2" SCH 80 PVC, FEMALE ADAPTER COUPLING AND 2" BRASS PLUG W/ RECESSED NUT. TERMINATE INSULATED, SOLID 14 GAUGE COPPER LOCATOR WIRES AT TOP W/ 12" OF EXTRA WIRE

PLAN VIEW



VALVE COLLAR AND IDENTIFICATION DISK
NTS

CITY OF ZEPHYRHILLS STANDARD DETAILS
CITY OF ZEPHYRHILLS UTILITY DEPARTMENT
39825 ALSTON AVENUE ZEPHYRHILLS, FLORIDA 33542
PHONE (813)780-0029 FAX (813)780-0613

NOVEMBER 2021

S-14

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BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

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8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

CIVIL DETAILS

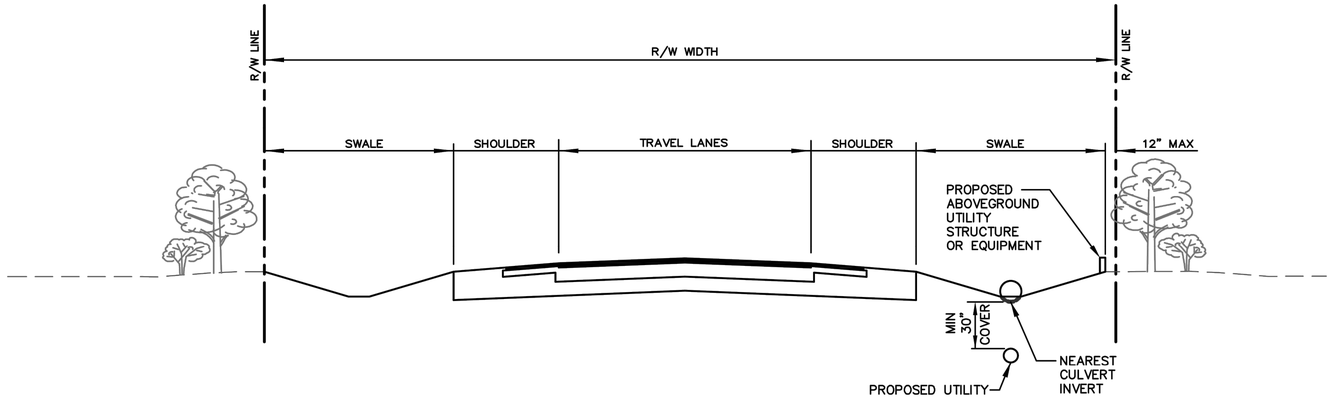
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PROJECT NO: 26110-051-01
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INDEX NO:
DWG NO: C26

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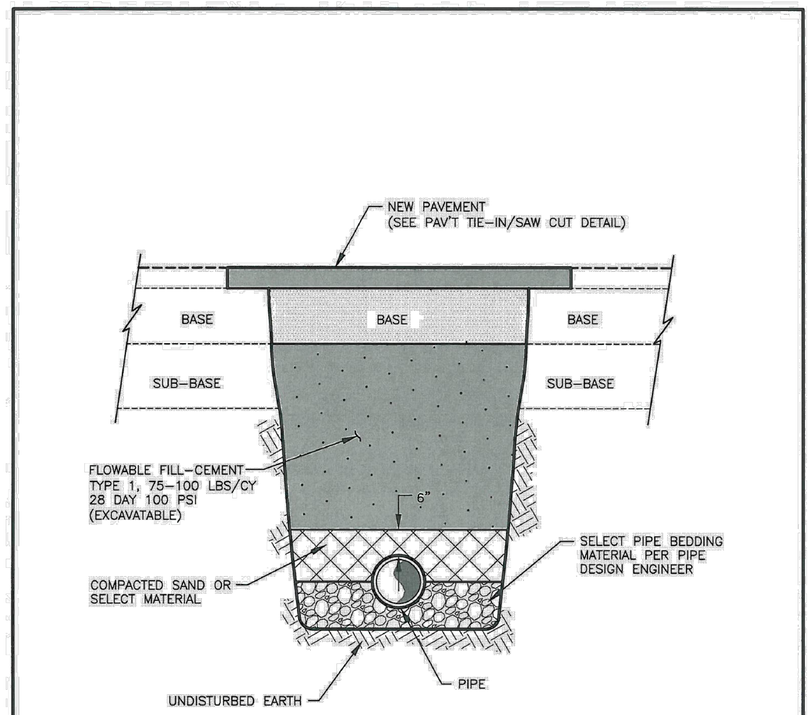
UTILITY INSTALLATION IN SWALE NEAR CULVERT

NTS

NOTE:
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PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	UTILITY INSTALLATION DETAIL RURAL ROADWAY TYPICAL SECTION	Sheet No. 1 of 1	
	APPROVED BY JCW BCC APPROVAL REVISED	Index No. 301	



TYPICAL TRENCH SECTION

NTS

NOTE:
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PASCO COUNTY ENGINEERING SERVICES DESIGN STANDARDS	FLOWABLE FILL	Sheet No. 1 of 1	
	APPROVED BY JCW BCC APPROVAL REVISED	Index No. 103	

09/09/08

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
MSS CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

CIVIL DETAILS

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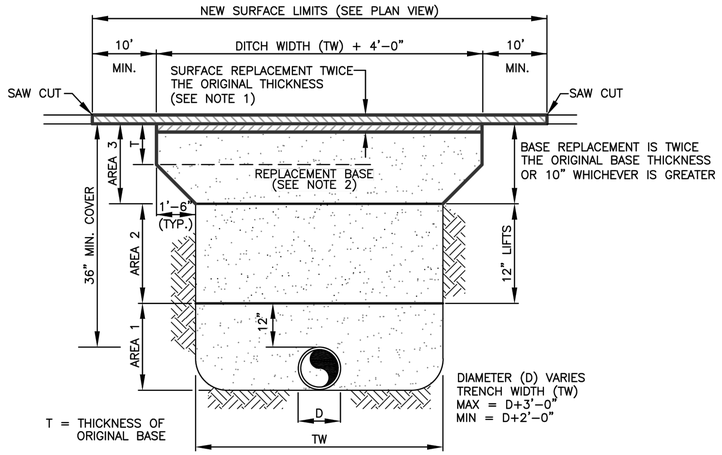
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26110-051-01	NOV. 2023
INDEX NO:	DWG NO: C27

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NOTES

1. REPLACEMENT ASPHALT SHALL BE TWICE THE ORIGINAL PAVEMENT THICKNESS WITH A MINIMUM OF TWO (2) INCHES AND SHALL BE SP 12.5 OR TYPE S-3 ASPHALT, AND FC-3 IF REQUIRED.
2. REPLACEMENT BASE SHALL BE NEW MATERIAL NOT REUSED FROM EXCAVATION. ACCEPTABLE BASE ALTERNATIVE SHALL BE TYPE ABC OR BETTER ASPHALT PLACED AT A TOTAL THICKNESS OF SIX (6) INCHES.
3. AREA 1 – BACKFILL SHALL BE PLACED IN SIX (6) INCH LIFT WITH EACH LIFT COMPACTED TO **98% OF ASTM FM5-521** USING MECHANICAL TAMPERS.
4. AREA 2 – BACKFILL SHALL BE PLACED IN TWELVE (12) INCH LIFTS WITH EACH LIFT COMPACTED TO **98% OF FM5-521** USING APPROPRIATE COMPACTING EQUIPMENT.
5. AREA 3 – LIMEROCK (LBR 100) BASE SHALL BE CONSTRUCTED IN LIFTS NOT GREATER THAN SIX (6) INCHES COMPACTED THICKNESS, AND HAVE A DENSITY EQUAL TO **98% OF FM5-521**.
6. FLOWABLE FILL MAY BE PLACED ABOVE AREA 1 UP TO THE BOTTOM OF THE RESTORED BASE. MIX DESIGN SHALL CONFORM TO FDOT STANDARD SPECIFICATIONS SECTION 121. IF FLOWABLE FILL IS USED FOR TRENCH BACKFILL, THE AMOUNT OF COVER ABOVE TOP OF PIPE TO AREA 2 MAY BE REDUCED TO 6 INCHES.

Tests shall be submitted to Pasco County Engineering Inspections verifying open cut restoration is per general notes before release of permit or gurantee, if applicable. Material and thickness verification shall be required. All testing shall be Pasco County Services Department Testing Specificatiions for Construction of Roads, Storm Drainage and Utilities; October 2006.

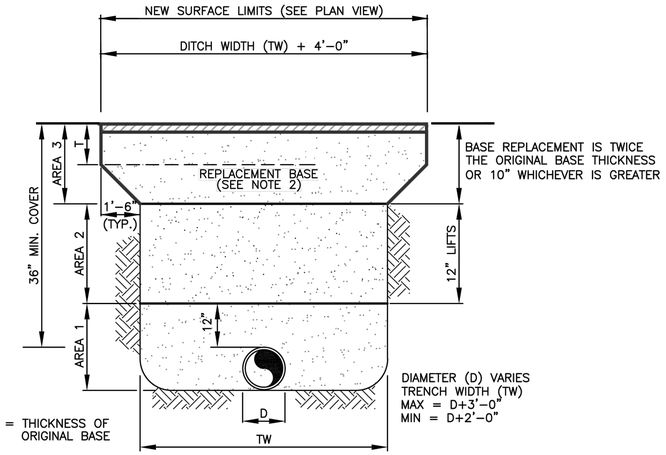
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PASCO COUNTY ENGINEERING SERVICES **DESIGN STANDARDS**	**OPEN CUT RESTORATION**	Sheet No. 1 of 1	
	APPROVED BY MICHAEL J. GARRETT, P.E.	BCC APPROVAL REVISED	Index No. 102

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09/09/08

TYPICAL ASPHALT PAVEMENT RESTORATION DETAIL 1

NTS



NOTES

1. REPLACEMENT ASPHALT SHALL BE TWICE THE ORIGINAL PAVEMENT THICKNESS WITH A MINIMUM OF TWO (2) INCHES AND SHALL BE SP 12.5 OR TYPE S-3 ASPHALT, AND FC-3 IF REQUIRED.
2. REPLACEMENT BASE SHALL BE NEW MATERIAL NOT REUSED FROM EXCAVATION. ACCEPTABLE BASE ALTERNATIVE SHALL BE TYPE ABC OR BETTER ASPHALT PLACED AT A TOTAL THICKNESS OF SIX (6) INCHES.
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PASCO COUNTY ENGINEERING SERVICES **DESIGN STANDARDS**	**OPEN CUT RESTORATION**	Sheet No. 1 of 1	
	APPROVED BY MICHAEL J. GARRETT, P.E.	BCC APPROVAL REVISED	Index No. 102

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TYPICAL LIMEROCK RESTORATION DETAIL 2

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LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
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8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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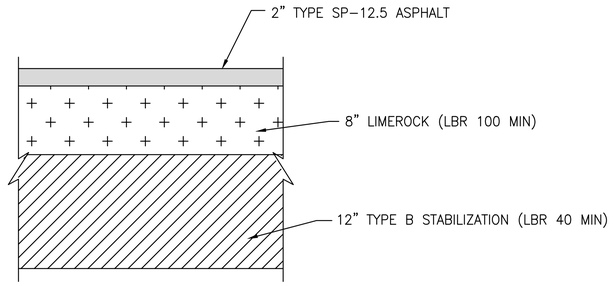
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INDEX NO:	DWG NO: C28

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TYPICAL ASPHALT PAVEMENT DETAIL 1

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SOUTH 301 W - WATER AND WASTEWATER PIPELINES

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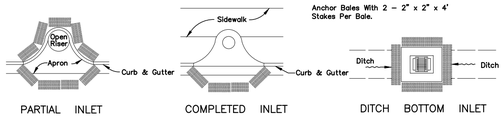
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INDEX NO:	DWG NO:
	C29

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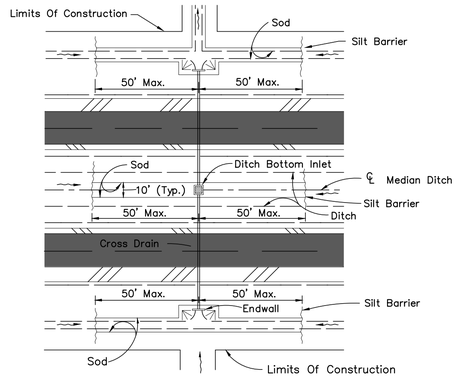
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EROSION AND SEDIMENT CONTROL NOTES

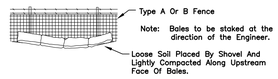
1. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING SILT FROM SITE IF NOT REUSABLE ON-SITE AND ASSURING PLAN ALIGNMENT AND GRADE IN ALL DITCHES AND SWALES AT COMPLETION OF CONSTRUCTION.
2. THE SITE CONTRACTOR IS RESPONSIBLE FOR REMOVING THE TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES AFTER COMPLETION OF CONSTRUCTION AND ONLY WHEN AREAS HAVE BEEN STABILIZED.
3. ADDITIONAL PROTECTION – ON-SITE PROTECTION IN ADDITION TO THE ABOVE MUST BE PROVIDED THAT WILL NOT PERMIT SILT TO LEAVE THE PROJECT CONFINES DUE TO UNSEEN CONDITIONS OR ACCIDENTS.
4. CONTRACTOR SHALL INSURE THAT ALL DRAINAGE STRUCTURES, PIPES, ETC. ARE CLEANED OUT AND WORKING PROPERLY AT TIME OF ACCEPTANCE.
5. WIRE MESH SHALL BE LAID OVER THE DROP INLET SO THAT THE WIRE EXTENDS A MINIMUM OF 1 FOOT BEYOND EACH SIDE OF THE INLET STRUCTURE. HARDWARE CLOTH OR COMPARABLE WIRE MESH WITH 1/2-INCH OPENINGS SHALL BE USED. IF MORE THAN ONE STRIP OF MESH IS NECESSARY, THE STRIPS SHALL BE OVERLAPPED.
6. FDOT NO. 1 COARSE AGGREGATE SHALL BE PLACED OVER THE WIRE MESH AS INDICATED IN D-903. THE DEPTH OF STONE SHALL BE AT LEAST 12 INCHES OVER THE ENTIRE INLET OPENING. THE STONE SHALL EXTEND BEYOND THE INLET OPENING AT LEAST 18 INCHES ON ALL SIDES.
7. IF THE STONE FILTER BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER ADEQUATELY PERFORMS ITS FUNCTION, THE STONES MUST BE PULLED AWAY FROM THE INLET, CLEANED AND REPLACED.
8. BALES SHALL BE EITHER WIRE-BOUND OR STRING-TIED WITH THE BINDINGS ORIENTED AROUND THE SIDES RATHER THAN OVER AND UNDER THE BALES.
9. BALES SHALL BE PLACED LENGTHWISE IN A SINGLE ROW SURROUNDING THE INLET, WITH THE ENDS OF ADJACENT BALES PRESSED TOGETHER.
10. THE FILTER BARRIER SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE EXCAVATED TO A MINIMUM DEPTH OF 8 INCHES. AFTER THE BALES ARE STAKED, THE EXCAVATED SOIL SHALL BE BACKFILLED AND COMPACTED AGAINST THE FILTER BARRIER.
11. EACH BALE SHALL BE SECURELY ANCHORED AND HELD IN PLACE BY AT LEAST TWO STAKES OR REBARS DRIVEN THROUGH THE BALE.
12. LOOSE STRAW SHOULD BE WEDGED BETWEEN BALES TO PREVENT WATER FROM ENTERING BETWEEN BALES.
13. STRAW BALE BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL.
14. CLOSE ATTENTION SHALL BE PAID TO THE REPAIR OF DAMAGED BALES, END RUNS AND UNDERCUTTING BENEATH BALES.
15. NECESSARY REPAIRS TO BARRIERS OR REPLACEMENT OF BALES SHALL BE ACCOMPLISHED PROMPTLY.
16. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE STRAW BALE BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM TO THE EXISTING GRADE, PREPARED AND SEEDED.
17. SILT FENCES AND FILTER BARRIERS SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
18. SHOULD THE FABRIC ON A SILT FENCE OR FILTER BARRIER DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE FABRIC SHALL BE REPLACED PROMPTLY.
19. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. THEY MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-THIRD THE HEIGHT OF THE BARRIER.
20. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE EXISTING GRADE, PREPARED AND SEEDED.
21. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
22. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
23. THE CONTRACTOR IS RESPONSIBLE FOR FOLLOWING THE BEST EROSION AND SEDIMENT CONTROL PRACTICES AS OUTLINED IN THE PLANS, SPECIFICATIONS AND ST. JOHNS RIVER WATER MANAGEMENT DISTRICT SPECIFICATIONS AND CRITERIA.
24. FOR ADDITIONAL INFORMATION ON SEDIMENT AND EROSION CONTROL REFER TO "THE FLORIDA DEVELOPMENT MANUAL – A GUIDE TO SOUND LAND AND WATER MANAGEMENT" FROM THE STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION (F.D.E.R.) CHAPTER 6.
25. EROSION AND SEDIMENT CONTROL BARRIERS SHALL BE PLACED ADJACENT TO ALL WETLAND AREAS WHERE THERE IS POTENTIAL FOR DOWNSTREAM WATER QUALITY DEGRADATION. SEE DETAIL SHEET FOR TYPICAL CONSTRUCTION.
26. ALL DISTURBED AREAS SHALL BE GRASSED, FERTILIZED, MULCHED AND MAINTAINED UNTIL A PERMANENT VEGETATIVE COVER IS ESTABLISHED.
27. SOD SHALL BE PLACED IN AREAS WHICH MAY REQUIRE IMMEDIATE EROSION PROTECTION TO ENSURE WATER QUALITY STANDARDS ARE MAINTAINED.
28. ANY DISCHARGE FROM DEWATERING ACTIVITY SHALL BE FILTERED AND CONVEYED TO THE OUTFALL IN A MANNER WHICH PREVENTS EROSION AND TRANSPORTATION OF SUSPENDED SOLIDS TO THE RECEIVING OUTFALL.
29. DEWATERING PUMPS SHALL NOT EXCEED THE CAPACITY OF THAT WHICH REQUIRES A CONSUMPTIVE USE PERMIT FROM THE ST. JOHNS RIVER WATER MANAGEMENT DISTRICT.
30. ALL DISTURBED AREAS TO BE STABILIZED THROUGH COMPACTION, SILT SCREENS, HAY BALES, AND GRASSING. ALL FILL SLOPES 3:1 OR STEEPER TO RECEIVE STAKED SOLID SOD.
31. ALL DEWATERING, EROSION, AND SEDIMENT CONTROL TO REMAIN IN PLACE AFTER COMPLETION OF CONSTRUCTION AND REMOVED ONLY WHEN AREAS HAVE STABILIZED.
32. THIS PLAN INDICATES THE MINIMUM EROSION AND SEDIMENT MEASURES REQUIRED FOR THIS PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR MEETING ALL APPLICABLE RULES, REGULATIONS AND WATER QUALITY GUIDELINES AND MAY NEED TO INSTALL ADDITIONAL CONTROLS.
33. THE CONTRACTOR SHALL BE REQUIRED TO RESPOND TO ALL WATER MANAGEMENT DISTRICT INQUIRIES, RELATIVE TO COMPLIANCE OF SJRWMD FOR EROSION AND SEDIMENTATION CONTROL. THE COST OF THIS COMPLIANCE SHALL BE PART OF THE CONTRACT.



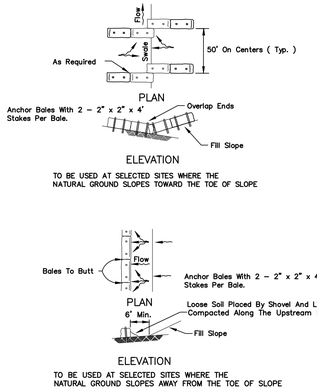
PROTECTION AROUND INLETS OR SIMILAR STRUCTURES



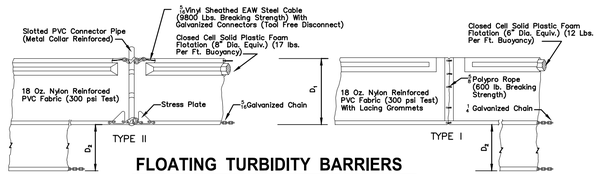
DITCH INSTALLATIONS AT DRAINAGE STRUCTURES



BALES BACKED BY FENCE

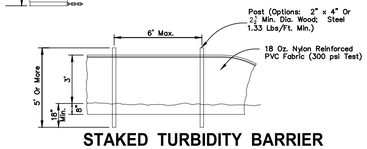


BARRIERS FOR FILL SLOPES

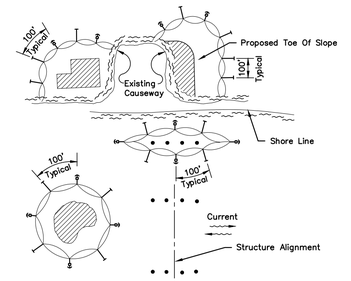


FLOATING TURBIDITY BARRIERS

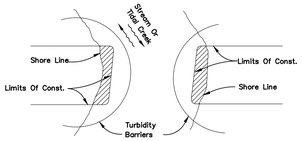
NOTICE:
COMPONENTS OF TYPES I & TYPE II MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES I AND II SHALL BE AS APPROVED BY THE ENGINEER.



STAKED TURBIDITY BARRIER



LEGEND
- Pile Locations
- Dredge Or Fill Area
- Mooring Buoy w/Anchor
- Anchor
- Barrier Movement Due To Current Action



Note:
Turbidity barriers for flowing streams and tidal creeks may be either floating, or staked types or any combinations of types that will suit site conditions and meet erosion control and water quality requirements. The barrier type(s) will be at the Contractors option unless otherwise specified in the plans, however payment will be under the contract lump sum price established in the bid proposal for Erosion & Sediment Control Posts in staked turbidity barriers to be installed in vertical position unless otherwise directed by the Engineer.

NOTES:
1. Turbidity barriers are to be used in all permanent bodies of water regardless of water depth.
2. Number and spacing of anchors dependent on current velocities.
3. Deployment of barrier around pile locations may vary to accommodate construction operations.
4. Navigation may require segmenting barrier during construction operations.
5. For additional information see Section 104 of the FDOT Standard Specifications.

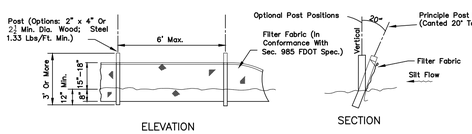
TURBIDITY BARRIER APPLICATIONS

TURBIDITY BARRIERS

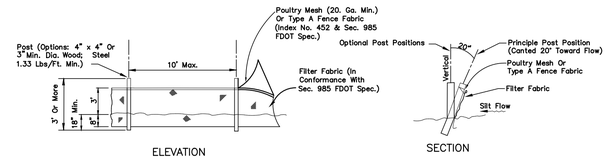
(D-907)
N.T.S.

HAY BALE LOCATION

(D-901)
N.T.S.

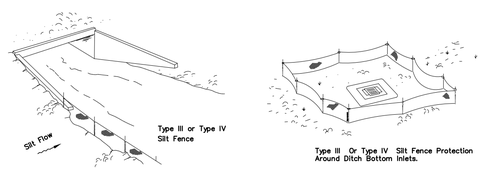


TYPE III SILT FENCE



Note: Silt Fence to be paid for under the contract lump sum price for Erosion and Sediment Control.

TYPE IV SILT FENCE



Do not deploy in a manner that silt fences will act as a dam across permanent flowing watercourses. Silt fences are to be used at upland locations and turbidity barriers used at permanent bodies of water.

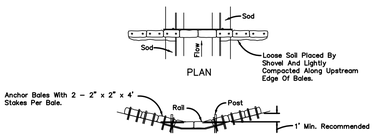


Note: Spacing for Type III & TYPE IV Fence to be in accordance with Chart 1, Sheet 1 of 3, FDOT Index No. 102 and ditch installations at drainage structures Sheet 2 of 3, FDOT Index No. 102.

SILT FENCE APPLICATIONS

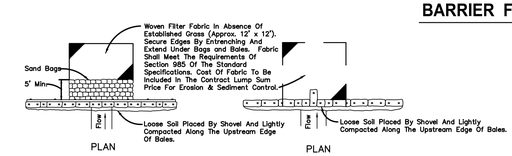
SILT FENCE TYPE III & IV

(D-908)
N.T.S.



Spacing: Bale barriers for paved ditches should be spaced in accordance with Chart 2, Sheet 1 of 3, Index No. 102

BARRIER FOR PAVED DITCH



Application and Spacing: The use of Types I & II bale barriers should be limited to the conditions outlined in Chart 1, Sheet 1 of 3, Index No. 102

TYPE II TYPE I

BARRIER FOR UNPAVED DITCHES

NOTE:
WHERE FDOT SPECS AND INDEX ARE REFERENCED, PLEASE REFER TO FDOT ROADWAY & TRAFFIC DESIGN STANDARDS, AND FDOT STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION.

HAY BALE BARRIERS TYPE I & II

(D-912)
N.T.S.

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

STORMWATER POLLUTION PREVENTION DETAILS

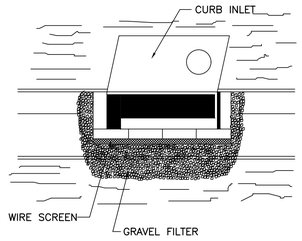
THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH A. FRASER, PE #57452 ON THE DATE SHOWN ON THE COVER SHEET.

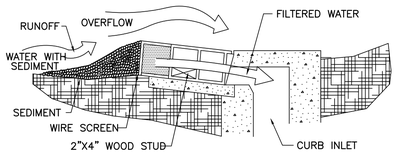
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PROJECT NO: 26110-051-01
DATE: NOV. 2023
INDEX NO:
DWG NO: EC1

SAVED: 8/11/2023 4:03 PM SSIMS Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\051-01 SOUTH 301 W-WW PIPELINES\DESIGN&CONSTRUCTION\CAD\DWGS\ENV\26110051101-EC02.DWG

© Jones Edmunds 2234



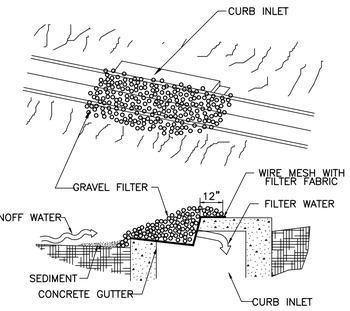


SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE AN OVERFLOW CAPABILITY IS NECESSARY TO PREVENT EXCESSIVE PONDING IN FRONT OF THE STRUCTURE.

BLOCK & GRAVEL CURB INLET SEDIMENT FILTER

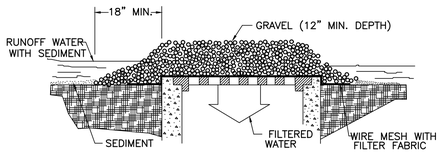
(D–902)
N.T.S.



GRAVEL CURB INLET SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE AT CURB INLETS WHERE PONDING IN FRONT OF THE STRUCTURE IS NOT LIKELY TO CAUSE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.



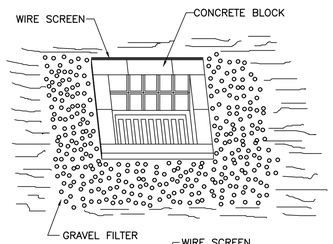
GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER

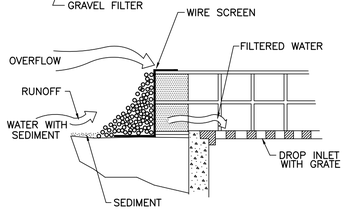
SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY CONCEN– TRATED FLOWS ARE EXPECTED, BUT NOT WHERE PONDING AROUND THE STRUCTURE MIGHT CAUSE EXCESSIVE INCONVENIENCE OR DAMAGE TO ADJACENT STRUCTURES AND UNPROTECTED AREAS.

GRAVEL INLET SEDIMENT TRAP

(D–903)
N.T.S.



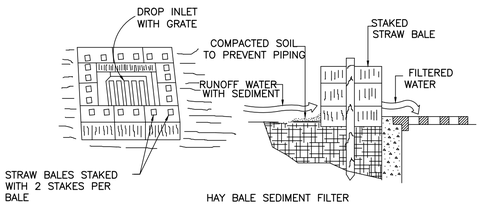


SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPACITY IS NECESSARY TO PREVENT EXCESSIVE PONDING AROUND THE STRUCTURE.

BLOCK & GRAVEL DROP INLET SEDIMENT FILTER

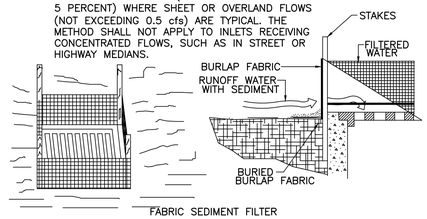
(D–904)
N.T.S.



HAY BALE SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 cfs) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS.



FABRIC SEDIMENT FILTER

SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPES NO GREATER THAN 5 PERCENT) WHERE SHEET OR OVERLAND FLOWS (NOT EXCEEDING 0.5 cfs) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS. SUCH AS IN STREET OR HIGHWAY MEDIANS.

DROP INLET SEDIMENT TRAP

(D–905)

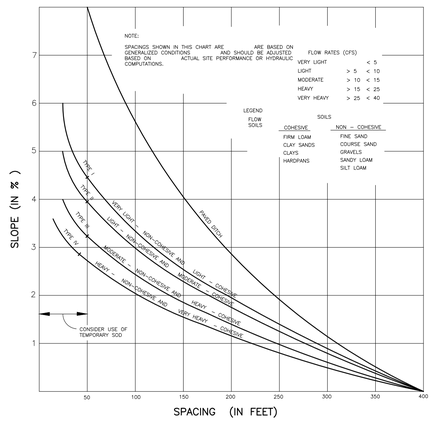
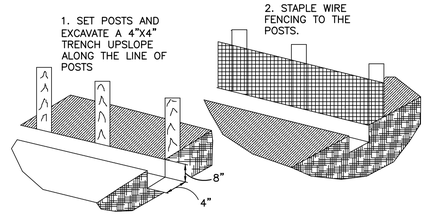


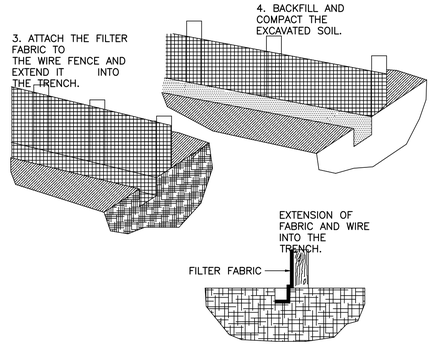
CHART I

RECOMMENDED SPACING FOR TYPE I AND TYPE II HAY BALE BARRIERS, AND TYPE III AND TYPE IV SILT FENCES AND PAVED DITCH HAY BALE BARRIERS

SPACING RECOMMENDATION FOR SILT FENCES & HAY BALES

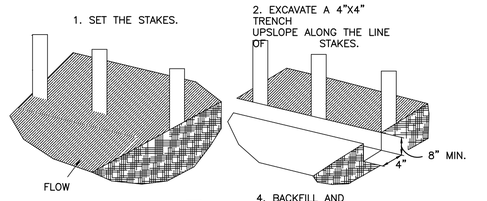
(D–906)
N.T.S.



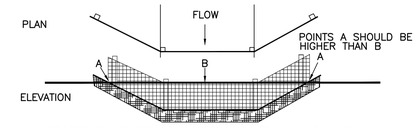


CONSTRUCTION DETAILS FOR SILT FENCES

(D–909)
N.T.S.



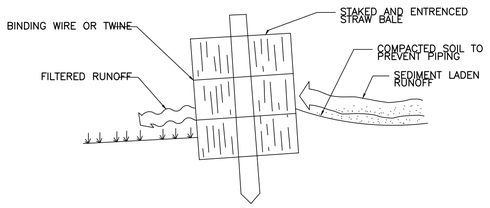
CONSTRUCTION OF A FILTER BARRIER



PROPER PLACEMENT OF A FILTER BARRIER IN A DRAINAGE WAY

FILTER BARRIER CONSTRUCTION DETAIL

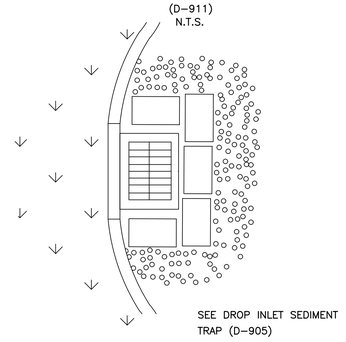
(D–910)
N.T.S.



CROSS–SECTION OF A PROPERLY INSTALLED STRAW BALE

STAKED HAY BALE

(D–911)
N.T.S.



SEE DROP INLET SEDIMENT TRAP (D–905)

ERECT SEDIMENT BARRIERS AT CATCH BASINS

(TYPICAL)

BID DOCUMENTS

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

STORMWATER POLLUTION PREVENTION DETAILS

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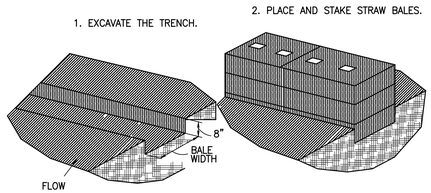
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PROJECT NO: 26110–051–01
DATE: NOV. 2023
INDEX NO:
DWG NO: EC2

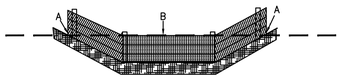
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PLOTTED: 11/8/2023 11:07:23 AM KEYLA VIRGILIO, EI

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CONSTRUCTION OF A HAY BALE BARRIER

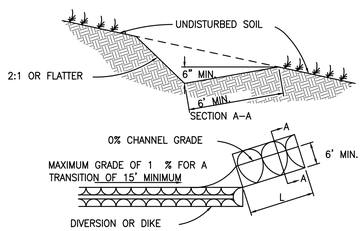


POINTS A SHOULD BE HIGHER THAN POINT B

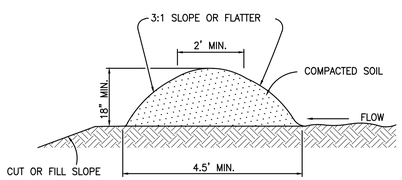
PROPER PLACEMENT OF HAY BALE BARRIER IN DRAINAGE WAY

HAY BALE BARRIER CONSTRUCTION DETAILS

(D-913)
N.T.S.



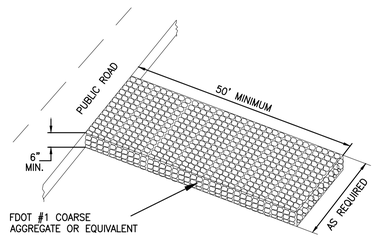
LEVEL SPREADER



TEMPORARY DIVERSION DIKE

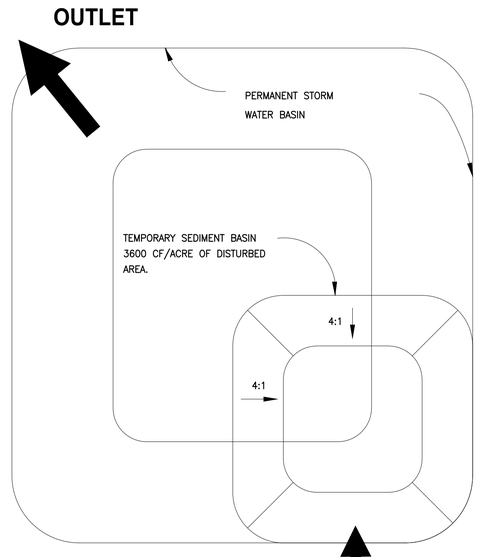
DIVERSION DIKE

(D-914)
N.T.S.



STABILIZED CONSTRUCTION ENTRANCE

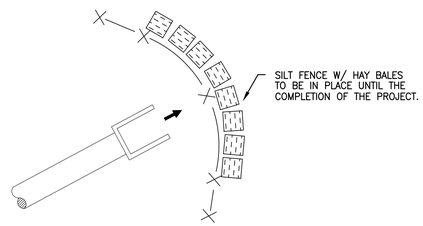
N.T.S.



NOTE: THIS REPRESENT THE OPTIMUM LOCATION OF THE TEMPORARY SEDIMENT BASIN. OTHER ON-SITE LOCATIONS MAY ALSO BE APPROPRIATE.

TEMPORARY SEDIMENT BASIN

N.T.S.



OUTLET PROTECTION

N.T.S.

BID DOCUMENTS

SAVED: 8/11/2023 4:04 PM SSIMS Y:\26110-CITY OF ZEPHYRHILLS\PROJECTS\051-01 SOUTH 301 W-WW PIPELINES\DESIGN&CONSTRUCTION\CAD\DWGS\ENV\26110051101-EC04.DWG

LTR.	DATE	REVISIONS	BY	APPRD.

DESIGNED K FRASER
DRAWN S SIMS
CHECKED D PLAVCAN

JonesEdmunds
730 NE WALDO ROAD, GAINESVILLE, FLORIDA 32641 / (352) 377-5821
8657 BAYPINE ROAD, BLDG. 5, SUITE 300 JACKSONVILLE, FLORIDA 32256 / (904) 744-5401

SOUTH 301 W - WATER AND WASTEWATER PIPELINES

STORMWATER POLLUTION PREVENTION DETAILS

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY KENNETH A. FRASER, PE #57452 ON THE DATE SHOWN ON THE COVER SHEET.

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PROJECT NO: 26110-051-01
DATE: NOV. 2023
INDEX NO:
DWG NO: EC3

US Water Services Corporation Proposal

Pricing unsealed at Jan 12, 2024 1:00 PM

CONTACT INFORMATION

Company
US Water Services Corporation

Email
ccrego@uswatercorp.net

Contact
Christina Crego

Address
4939 CROSS BAYOU BOULEVARD
New Port Richey FL 34652
NEW PORT RICHEY, FL 34652

Phone
(727) 848-8292 Ext: 222

Website
www.uswatercorp.com

Submission Date
Jan 12, 2024 12:29 PM

ADDENDA CONFIRMATION

Addendum #1
Confirmed Dec 29, 2023 3:08 PM by Christina Crego

Addendum #2
Confirmed Dec 29, 2023 3:08 PM by Christina Crego

Addendum #3
Confirmed Dec 29, 2023 3:08 PM by Christina Crego

Addendum #4
Confirmed Dec 29, 2023 3:08 PM by Christina Crego

Addendum #5
Confirmed Jan 9, 2024 10:41 AM by Christina Crego

QUESTIONNAIRE

1. Respondent Submittals (without Cost)* ☐ Pass ☐ Fail

Please Upload your COMPLETE response, including any and all required forms listed in the solicitation and the corresponding attachments.

(Do not upload cost information in here)

USW_W-9_Signed.pdf

CGC003307_Cecil_Delcher_08.2024.pdf

CUC1223914_G.Deremer_08.2024.pdf

Detail_by_Entity_Name_01.2024.pdf

3.1._ITB_Cover_Page-Signed_Notarized_(signed).pdf

3.4._Page_22-Package_Signed_(signed).pdf

3.5._Bid_Bond_(signed).pdf

3.6._Public_Entity_Crimes-Signed_Notarized_(signed).pdf

3.7._E-verify_Certification_(signed).pdf

3.8._Addenda_Acknowledgement_(signed).pdf

3.9._Drug_Free_Workplace_Form_(signed).pdf

3.10._Non-Collusive_Affidavit_(signed).pdf

3.11._Errors_or_Omissions_(signed).pdf

3.12._References-Similar_Projects_(Completed).pdf

3.13._References-Active_Projects_(completed).pdf

3.14._Certification_of_Debarment_Suspension_(signed).pdf

3.15._Trench_Safety_Form_(signed).pdf

3.2._Bid_Form_-_Part_1_(signed).pdf

3.3._Bid_Form_Part_2-Detailed_A3.pdf

2. I certify that I have read, understood and agree to the terms in this solicitation, and that I am authorized to submit this response on behalf of my company.*

☑ Confirmed ☐ Pass ☐ Fail

3. Response Checklist

By selecting confirm, you are certifying that you have submitted the corresponding attachments and documents as part of your submittal in the question "Respondent Submittals (without cost)"

3.1. ITB Cover Page-Signed/Notarized Included In Response ☐ Pass ☐ Fail

☑ Confirmed

3.2. Bid Form - Part 1 Included in your Response ☐ Pass ☐ Fail

☑ Confirmed

3.3. Bid Form Part 2-Detailed Included in your Response ☐ Pass ☐ Fail

☑ Confirmed

3.4. Page 22-Package Signed and Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.5. Bid Bond - Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.6. Public Entity Crimes-Signed/Notarized Incl in response ☐ Pass ☐ Fail

☑ Confirmed

3.7. E-verify Certification-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.8. Addenda Acknowledgement-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.9. Drug Free Workplace Form - Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.10. Non-Collusive Affidavit-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.11. Errors or Omissions-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.12. References-Similar Projects-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.13. References-Active Projects included in Response ☐ Pass ☐ Fail

☑ Confirmed

3.14. Certification of Debarment/Suspension - Included in response ☐ Pass ☐ Fail

☑ Confirmed

3.15. Trench Safety Form-Included in Response ☐ Pass ☐ Fail

☑ Confirmed

PRICE TABLES

South 301 W Water and Wastewater Pipelines

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions	1	LS	$41,257.00	$41,257.00
2	Traffic Control	1	LS	$30,000.00	$30,000.00
3	Environmental Protection	1	LS	$150,000.00	$150,000.00
4	Construction Survey and Layout	1	LS	$12,877.00	$12,877.00
5	6-Inch Sanitary Sewer Force Main via Open-Cut	1300	LF	$109.65	$142,545.00
6	6-Inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	4400	LF	$44.92	$197,648.00
7	8-Inch Potable Water Main via Open-Cut	600	LF	$164.18	$98,508.00

8	8-Inch Potable Water Main via HDD	1900	LF	$62.72	$119,168.00
9	Combination Air/Vacuum Valves and Vaults	10	EA	$5,000.00	$50,000.00
10	Concrete Restoration	50	SY	$150.00	$7,500.00
11	Limerock Restoration	355	SY	$35.00	$12,425.00
12	Asphalt Concrete Restoration	278	SY	$25.00	$6,950.00
13	Testing Allowance	1	AL	$25,000.00	$25,000.00
14	Record Drawings Allowance	1	AL	$15,000.00	$15,000.00
	Total				**$908,878.00**

Contingency

10% of Total Bid Form

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	Contingency - 10%	1	EA	$90,887.80	$90,887.80
	Total				**$90,887.80**

AGENCY:		INVITATION TO BID
CITY OF ZEPHYRHILLS ATTN: PURCHASING DEPT 5335 8TH STREET ZEPHYRHILLS, FL 33542	Zephyrhills jump right in	Response Acknowledgement

PURCHASING AGENT: Karen Miller	AN EQUAL OPPORTUNITY EMPLOYER	
Phone: 813-780-0000 x3536	FLORIDA TAX EXEMPT	#85-8012740166C-4
Email: kmiller@ci.zephyrhills.fl.us	FEDERAL IDENTIFICATION NUMBER	#59-6000455

Obtained ALL Bid Documents and Submit Q&A and Responses electronically on: OPENGOV - LINK ON WEBSITE WWW.CI.ZEPHYRHILLS.FL.US

BID/PROPOSAL NUMBER	DISTRIBUTION DATE	BID/PROPOSAL TITLE	BID/PROPOSAL RESPONSES OPENING DATE/TIME
ITB 2023-03	11/20/2023	South 301 W Water & Wastewater Pipeline	OpenGov Online- Friday, January 12, 2024 before 1 PM

TELE CONFERENCE DATE GoTo Meetng ☒ Strongly Recommended ☐ None	RESPONSES RECEIVED AFTER ABOVE
DATE: 12-4-2023 TIME: 10:00 AM 2nd Floor Conference Room	DATE AND TIME
GoTo LINK: https://meet.goto.com/159259221 Or, City Hall-2nd Flr Conf Rm	WILL NOT BE ACCEPTED
Call: 1-335-602-4523 ACCESS CODE: 269-369-332	Bid Bonds must be received

SITE VISIT: After the Meeting

VENDOR MUST COMPLETE THE BELOW AREAS AND RETURN FORM, NOTARIZED. FORM IS REQUIRED.

RESPONDER'S NAME/ADDRESS:
U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652

TELPHONE NUMBER: 727 848 8292

EMAIL ADDRESS: CCREGO@USWATERCORP.NET

If returning as a "NO" state reason:

I certify this Response is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a Response for the same materials, supplies or equipment, and is in all respects fair and without collusion or fraud. I agree to all conditions of this Bid/Proposal and certify that I am authorized to sign this Response for the company. In submitting a Response to the City of Zephyrhills the Responder offers and agrees that if this Response is accepted, the Company will convey, sell, assign or transfer to the City of Zephyrhills all rights, title, and interest in and to all causes of action it may now or hereafter acquire under the Anti-trust laws of the United States and the State of Florida for price fixing relating to the particular commodities or services purchased or acquired by the City of Zephyrhills. At the City's discretion, such assignment shall be made and become effective at the time the City tenders final payment to the Company.

FEDERAL EMPLOYER ID NUMBER OR SS NUMBER:
20-0008821

X

AUTHORIZED SIGNATURE

Gary Deremer, President

PRINTED NAME/TITLE

THIS FORM MUST BE NOTARIZED BELOW

Sworn to and subscribed to me this 12th day of January, 2024

Personally known: ☒ Or produced identification: ☐

Type of ID: _____

Christina R Crego — Florida

Notary Signature — State

My commission expires: January 26, 2025

AFFIX NOTARY STAMP BELOW

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

BONDS

An EBond shall be included in your uploaded response or a certified check delivered to City Hall before the deadline for an amount not less than five (5%) of the total bid price and shall be made payable to the City as a guarantee that the Bidder will not withdraw his bid for a period of forty-five (45) days after bid closing time. Bid, Payment and Performance Bond and all Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

THE CITY OF ZEPHYRHILLS RESERVES THE RIGHT TO REJECT ANY OR ALL PROPOSALS, TO WAIVE INFORMALITIES, AND TO ACCEPT ALL OR ANY PART OF ANY RESPONSE/PROPOSAL AS MAY BE DEEMED TO BE IN THE BEST INTEREST OF THE CITY UNLESS OTHERWISE NOTED, PAYMENT OF GOODS OR SERVICES PROVIDED AS A RESULT OF THIS SOLICITATION WILL BE MADE PER FLORIDA STATUTE. ALL VENDORS MUST SUBMIT A COMPLETED W-9 FORM.

BID RESPONSE FORM
Detailed Bid Form to be Submitted on Page 6, Technical Specifications

In accordance with the Specifications contained herein, I certify that any and all information contained in this bid response is true; and I further certify that this bid is made without prior understanding, agreement, or connections with any corporation, firm or person submitting a bid for the same materials, supplies, equipment, or services and is in all respects fair and without collusion or fraud. I agree to abide by all terms and conditions of the bid, and certify that I am authorized to sign for the applicant firm. *Please print the following and sign your name.*

Amount of Base Bid	$ 908,878.00
10% Contingency *Contingency is not guaranteed.*	$ 90,887.80
Total Contract Sum (Amount of Bid + Contingency)	$ 999,765.80

Any contingency items shall be communicated by written change order and shall be approved by both the Owner and Contractor.

Total Contract Sum of Bid in Words: NINE HUNDRED NINETY-NINE THOUSAND SEVEN HUNDRED SIXTY-FIVE AND EIGHT TENTHS

The **BIDDER** must submit a bid on all items contained in specification or the bid shall be considered irregular. The **OWNER** reserves the right to accept or reject the bid. The **OWNER**, or his representative, further reserves the unqualified right to determine whether any particular item or items or materials, equipment, or whatsoever is an approved equal, and reserves the unqualified right to a final decision regarding the approval or rejection of the same. The bid selection shall be based on the apparent low bidder for the **"TOTAL CONTRACT SUM"**.

Add'l Documents Included:
- [X] Bid Form
- [X] Bid Bond/Check
- [X] References
- [X] Public Entity Crimes
- [X] License(s) copies
- [X] Drug Free Workplace
- [ ] No-Bid
- [X] Page 22, Signature/Seal
- [X] Addenda Affidavit
- [X] E-Verify
- [X] Non Collusive
- [X] Certification re: Debarment, Suspension, Ineligibility & Voluntary Exclusion

NAME, ADDRESS, AND SIGNATURE OF BIDDER:

NAME: Gary Deremer **TITLE:** President

ADDRESS: 4939 Cross Bayou Blvd., New Port Richey FL 34652

PHONE: 727 848 8292 **FAX:** 727 842 6412

E-MAIL ADDRESS: CCREGO@USWATERCORP.NET

BIDDER SIGNATURE: _____ **DATE:** January 12, 2024

Corporate Seal or Notarization below date

US Water Services Corporation CORPORATE SEAL 2003 FLORIDA

BID REQUIREMENTS

CITY OF ZEPHYRHILLS
South 301 W Water and Wastewater Pipelines
CONSTRUCTION ITEMIZED PRICING SHEET

Item No.	Item Description	Qty.	Unit	Unit Price	Amount
BASE BID					
1	Mobilization, Demobilization, Performance and Payment Bonds, Health and Safety Requirements, and General Conditions (5% of Base Bid)	1	LS	$41,257.00	$41,257.00
2	Traffic Control	1	LS	$30,000.00	$30,000.00
3	Environmental Protection	1	LS	$150,000.00	$150,000.00
4	Construction Survey and Layout (1.5% of Base Bid)	1	LS	$12,877.00	$12,877.00
5	6-Inch Sanitary Sewer Force Main via Open-Cut	1,300	LF	$109.65	$142,545.00
6	6-inch Sanitary Sewer Force Main via Horizontal Directional Drill (HDD)	4,400	LF	$44.92	$197,648.00
7	8-Inch Potable Water Main via Open-Cut	600	LF	$164.18	$98,508.00
8	8-inch Potable Water Main via HDD	1,900	LF	$62.72	$119,168.00
9	Combination Air/Vacuum Valves and Vaults	10	EA	$5,000.00	50,000.00
10	Concrete Restoration	50	SY	$150.00	$7,500.00
11	Limerock Restoration	355	SY	$35.00	$12,425.00
12	Asphalt Concrete Restoration	278	SY	$25.00	$6,950.00
13	Testing Allowance	1	AL	$	$25,000.00
14	Record/As-Built Drawings Allowance	1	AL	$	$15,000.00
	TOTAL BID PRICE	908,878.00			

Photographs of the Project. *If required by the Owner, the Contractor/Vendor shall furnish photographs of the project, in the quantities* as requested.

Tests and Inspections: All materials and equipment used in the construction of the project shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Owner. The offer or payment of any compensation, whatever may be its character or form, the offer or giving of any gratuity, or the offer or granting of any valuable favor by the Contractor/Vendor to any Inspection, directly or indirectly, is strictly prohibited, and any such act on the part of the Contractor/Vendor will constitute a violation of this Contract.

If the Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any work to specifically be inspected, tested, or approved by someone other than the Contractor/Vendor, the Contractor/Vendor shall give the City notice of readiness therefore. The Contractor/Vendor shall furnish the City the required certificates of inspection, testing or approval. All such tests shall be in accordance with the methods prescribed by the American Society for Testing and Materials or such other applicable organization as may be required by law or the Contract Documents. If any such work required so to be inspected, tested or approved is covered without approval of the City, it shall be requested by the City, be uncovered for observation at the Contractor's or Vendor's expense. The cost of such inspections, tests, and approvals shall be borne by the Contractor/Vendor unless otherwise provided.

The City of Zephyrhills shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records.

Use and Occupancy Prior to Acceptance by City: The Contractor/Vendor agrees to the use and occupancy of a portion or unit of the project before formal acceptance by the City, provided the City:

A. Secures written consent of the Contractor/Vendor except in the event, in the opinion of the Architect/Engineer, the Contractor/Vendor is chargeable with unwarranted delay in final cleanup or punch list items or other contract requirements.
B. Secures endorsement from the insurance-carrier and consent of the Surety permitting occupancy of the building or use of the project during the remaining period of construction.

Acceptance: Upon completion, the project manager shall inspect the project to assure all quality control standards are in compliance with the plans and specifications contained herein. The contract retainage ten (10%) will be released for final payment upon completion of all punch list items.

Guarantee and Warranties: Neither the final certificate of payment nor any provision in the Contract Documents, nor partial or entire occupancy of the premises by the City, shall constitute an acceptance of work not done in accordance with the Contract Documents or relieve the Contractor/Vendor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The

Contractor/Vendor shall remedy any defect in the work and pay for any damage to other work resulting there from, which shall appear within a period of one (1) year from the date of final acceptance of the work unless a longer period is specified. The City will give notice of observed defects with reasonable promptness.

All guarantees and warranties shall commence on the date of substantial completion or on acceptance by the owner of re-work items. The Contractor shall furnish a one (1) year unconditional warranty. The

warranty shall include all manufacturers' warranties on equipment and material installed by the Contractor or any subcontractors. These items shall be transferred to the City and in the City's name. All warranty items shall be secured in an organized 3-ring binder.

City May Stop the Work: If the work is defective, or the Contractor/Vendor fails to supply sufficient skilled workmen or suitable materials or equipment or if the Contractor/Vendor fails to make prompt payments to Subcontractors for labor, materials, or equipment, the City may order the Contractor/Vendor to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the City to stop the work shall not give rise to any duty on the part of the City to exercise this right for the benefit of the Contractor/Vendor or any other party.

For each consecutive calendar day that the work remains incomplete after the date established for final completion, the Contractor/Vendor shall pay City and the City is authorized to retain from the compensation otherwise to be paid to the Contractor/Vendor the sum of the phase schedule, **$1000.00**. This amount is the minimum measure of damages the City will sustain by failure of the Contractor to complete all remedial work, correct deficient work, clean up the project and other miscellaneous tasks as required to complete all work specified. This amount is in addition to the liquidated damages prescribed above, and likewise shall not be construed as a penalty.

The Bidder hereby agrees that the City reserves the right to waive any bid and to reject any or all bids, or to accept any bid that in its judgment will be in the best interest of the City. The bidder's signature understands and acknowledges the requirements set forth in this bid package.

Signature/Print Name/Company
Gary Dermer, U.S. Water Services Corporation

January 12, 2024
Date

In witness whereof, the Bidder has hereunto set his signature and affixed his seal this 12th day of January A.D. 2024

(Seal)

By: Gary Dermer

Title: President

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

THE AMERICAN INSTITUTE OF ARCHITECTS

Executed in 1 Counterpart(s)

AIA Document A310

Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we

U. S. Water Services Corporation
4939 Cross Bayou Blvd.
New Port Richey, FL 34652

(Here insert full name and address or legal title of Contractor/Vendor)

as Principal, hereinafter called the Principal, and

Swiss Re Corporate Solutions America Insurance Corporation
1200 Main Street, Suite 800, Kansas City, MO 64105

(Here insert full name and address or legal title of Surety)

a corporation duly organized under the laws of the State of Missouri

as Surety, hereinafter called the Surety, are held and firmly bound unto

Zephyrhills FL
5335 8th Street, Zephyrhills, FL 33542

(Here insert full name and address or legal title of Owner)

Bonds and All Insurance shall be secured from or countersigned by an Agency or Surety Company recognized in good standing and authorized to do business in the State of Florida.

as Obligee, hereinafter called the Obligee, in the sum of Five Percent of Bid Amount ---------- **Dollars ($** 5% of Bid

for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, The Principal has submitted a bid for

ITB-2023-03 South 301 W Water/Wastewater Pipeline

(Here insert full name, address and description of project)

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and Sealed this 12th ***of*** January ***2024***

U. S. Water Services Corporation

(Principal and Title) Gary Doremus President ***(Seal)***

(Witness)

(Attorney-in-Fact & Licensed Resident Agent) April L. Lively
Swiss Re Corporate Solutions America Insurance Corporation
Guignard Company/Inquiries (407) 834-0022

(Surety Seal)

SWORN STATEMENT PURSUANT TO SECTION 287.133(3)(a),

SWISS RE CORPORATE SOLUTIONS

SWISS RE CORPORATE SOLUTIONS AMERICA INSURANCE CORPORATION ("SRCSAIC")
SWISS RE CORPORATE SOLUTIONS PREMIER INSURANCE CORPORATION ("SRCSPIC")
WESTPORT INSURANCE CORPORATION ("WIC")

GENERAL POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, THAT SRCSAIC, a corporation duly organized and existing under laws of the State of Missouri, and having its principal office in the City of Kansas City, Missouri, and SRCSPIC, a corporation organized and existing under the laws of the State of Missouri and having its principal office in the City of Kansas City, Missouri, and WIC, organized under the laws of the State of Missouri, and having its principal office in the City of Kansas City, Missouri, each does hereby make, constitute and appoint:

J.W. GUIGNARD, BRYCE R. GUIGNARD, PAUL J. CIAMBRIELLO, APRIL L. LIVELY, JENNIFER L. HINDLEY, MARGIE L. MORRIS,

DEBORAH ANN MURRAY, M. GARY FRANCIS, CHRISTINE MORTON, KELLY PHELAN, and ALLYSON FOSS WING

JOINTLY OR SEVERALLY

Its true and lawful Attorney(s)-in-Fact, to make, execute, seal and deliver, for and on its behalf and as its act and deed, bonds or other writings obligatory in the nature of a bond on behalf of each of said Companies, as surety, on contracts of suretyship as are or may be required or permitted by law, regulation, contract or otherwise, provided that no bond or undertaking or contract or suretyship executed under this authority shall exceed the amount of:

TWO HUNDRED MILLION ($200,000,000.00) DOLLARS

This Power of Attorney is granted and is signed by facsimile under and by the authority of the following Resolutions adopted by the Boards of Directors of both SRCSAIC and SRCSPIC at meetings duly called and held on the 18th of November 2021 and WIC by written consent of its Executive Committee dated July 18, 2011.

"RESOLVED, that any two of the President, any Managing Director, any Senior Vice President, any Vice President, the Secretary or any Assistant Secretary be, and each or any of them hereby is, authorized to execute a Power of Attorney qualifying the attorney named in the given Power of Attorney to execute on behalf of the Corporation bonds, undertakings and all contracts of surety, and that each or any of them hereby is authorized to attest to the execution of any such Power of Attorney and to attach therein the seal of the Corporation; and it is

FURTHER RESOLVED, that the signature of such officers and the seal of the Corporation may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signatures or facsimile seal shall be binding upon the Corporation when so affixed and in the future with regard to any bond, undertaking or contract of surety to which it is attached."

SWISS RE CORPORATE SOLUTIONS AMERICA INSURANCE CORPORATION CORPORATE SEAL 1973 MISSOURI

SWISS RE CORPORATE SOLUTIONS PREMIER INSURANCE CORPORATION CORPORATE SEAL MISSOURI

By_____
Erik Janssens, Senior Vice President of SRCSAIC & Senior Vice President of SRCSPIC & Senior Vice President of WIC

By_____
Gerald Jagrowski, Vice President of SRCSAIC & Vice President of SRCSPIC & Vice President of WIC

WESTPORT INSURANCE CORPORATION CORPORATE SEAL MISSOURI

IN WITNESS WHEREOF, SRCSAIC, SRCSPIC, and WIC have caused their official seals to be hereunto affixed, and these presents to be signed by their authorized officers

this 10 day of NOVEMBER, 20 22

State of Illinois
County of Cook SS

Swiss Re Corporate Solutions America Insurance Corporation
Swiss Re Corporate Solutions Premier Insurance Corporation
Westport Insurance Corporation

On this 10 day of NOVEMBER, 20 22, before me, a Notary Public personally appeared Erik Janssens, Senior Vice President of SRCSAIC and Senior Vice President of SRCSPIC and Senior Vice President of WIC and Gerald Jagrowski, Vice President of SRCSAIC and Vice President of SPCSPIC and Vice President of WIC, personally known to me, who being by me duly sworn, acknowledged that they signed the above Power of Attorney as officers of and acknowledged said instrument to be the voluntary act and deed of their respective companies.

OFFICIAL SEAL
CHRISTINA MANISCO
NOTARY PUBLIC, STATE OF ILLINOIS
My Commission Expires March 29, 2026

Christina Manisco, Notary

I, Jeffrey Goldberg, the duly elected Senior Vice President and Assistant Secretary of SRCSAIC and SRCSPIC and WIC, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney given by said SRCSAIC and SRCSPIC and WIC, which is still in full force and effect.
IN WITNESS WHEREOF, I have set my hand and affixed the seals of the Companies this 12th day of January, 20 24.

Jeffrey Goldberg, Senior Vice President &
Assistant Secretary of SRCSAIC and
SRCSPIC and WIC

FLORIDA STATUTES ON PUBLIC ENTITY CRIMES- ITB-2023-03

THIS FORM MUST BE SIGNED AND SWORN TO IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICIAL AUTHORIZED TO ADMINISTER OATHS.

A. This sworn statement is submitted to City of Zephyrhills
(print name of the public entity)

by Gary Deremer, President
(print individual's name and title)

for U.S. Water Services Corporation
(print name of entity submitting sworn statement)

whose business address is

4939 Cross Bayou Blvd., New Port Richey FL 34652

and (if applicable) its Federal Employer Identification Number (FEIN) is 20-008821
(If the entity has no FEIN, include the Social ro Number of the individual signing this sworn statement: .)

B. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or of the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

C. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

D. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes means:

a. A predecessor or successor of a person convicted of a public entity crime; or
b. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

E. I understand that a "person" as defined in Paragraph 287.133(1)(e), Florida Statutes means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or

applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

F. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Indicate which statement applies.)

_X_ Neither the entity submitting this sworn statement, nor any of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, nor any affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ The entity submitting this sworn statement, or one or more of its officers, directors, executives, partners, shareholders, employees, members, or agents who are active in the management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989. However, there has been a subsequent proceeding before a Hearing Officer of the State of Florida, Division of Administrative Hearings and the Final Order entered by the Hearing Officer determined that it was not in the public interest to place the entity submitting this sworn statement on the convicted vendor list. (attach a copy of the final order)

I UNDERSTAND THAT THE SUBMISSION OF THIS FORM TO THE CONTRACTING OFFICER FOR THE PUBLIC ENTITY IDENTIFIED IN PARAGRAPH 1 (ONE) ABOVE IS FOR THAT PUBLIC ENTITY ONLY AND, THAT THIS FORM IS VALID THROUGH DECEMBER 31 OF THE CALENDAR YEAR IN WHICH IT IS FILED. I ALSO UNDERSTAND THAT I AM REQUIRED TO INFORM THE PUBLIC ENTITY PRIOR TO ENTERING INTO A CONTRACT IN EXCESS OF THE THRESHOLD AMOUNT PROVIDED IN SECTION 287.017, FLORIDA STATUTES FOR CATEGORY TWO OF ANY CHANGE IN THE INFORMATION CONTAINED IN THIS FORM.

_____
(Signature) Gary Deremer, President
State of Incorporation: Florida
U.S. Water Services Corporation
4939 Cross Bayou Blvd., New Port Richey FL 34652

Sworn to and subscribed before me this 12th day of January, 2024. Personally or known

Or Produced identification _____ Notary Public – State of Florida

_____
My commission expires January 26, 2025 (Type of Identification) _____
(Printed, Typed or stamped commissioned name of notary public)

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

E-VERIFY CERTIFICATION FORM- ITB 2023-03

All vendors, contractors and subcontractors doing business with the City of Zephyrhills must certify that they have implemented the federal E-Verify program.

E-Verify is a federal system established by the Department of Homeland Security to determine the immigration and work-eligibility status of prospective employees. Detailed E-Verify program information for employers can be found at http://www.dhs.gov/e-verify.

Prior to providing goods or services to the City of Zephyrhills, vendors must certify compliance with the federal E-Verify program. In the case of contractors, this includes obtaining written certification from all subcontractors who will participate in the performance of the contract. The certification below has been prepared for all vendors and contractors to use for this purpose. All subcontractor certifications must be kept on file with the contract vendor and made available to the state and/or City upon request.

CERTIFICATION

(In accordance with Executive Order No. 11-02)

I certify that the company shown below is in compliance with the above statement and that I am authorized to sign on its behalf.

Name of Company: U.S. Water Services Corporation

Authorized Signature: _____

Printed Name/Title: Gary Dermer, President

Address: 4939 Cross Bayou Blvd., New Port Richey FL 34652

Date: January 12, 2024

Phone: 727 848 8292

Email: CCREGO@USWATERCORP.NET

The City of Zephyrhills reserves the right to determine how it will respond to any instances of non-compliance or false certification of compliance. Potential City actions include, but are not limited to, cancellation of the contract and/or suspending or debarring the contract vendor from performing services in any aspect to the City.

Please send the completed form with your submittal.

Addenda Receipt Acknowledgment- ITB 2023-03

Addendum #	1	Date	12/4/23	Initials	
Addendum #	2	Date	12/14/23	Initials	
Addendum #	3	Date	12/27/23	Initials	
Addendum #	4	Date	12/29/23	Initials	
	5		1/5/24		

Firm Representative:

Signature/Date **(Executed by Corporate Authority)**

Gary Deremer, President
U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652
State of Incorporation: Florida

DRUG-FREE WORKPLACE FORM- ITB 2023-03

The undersigned vendor, in accordance with Florida Statute 287.087, hereby

certifies that U.S. Water Services Corporation does:
(Name of Business)

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.

2. Inform employees about the dangers of drug abuse in the workplace, the business' policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.

3. Give each employee engaged in providing the commodities or contractual services that are under bid a copy of the statement specified in subsection (1).

4. In the statement specified in subsection (1), notify the employees that, as a condition of working on the commodities or contractual services that are under bid, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or pleas of guilty or nolo contendere to, any violation of chapter 893 or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.

5. Impose a sanction on, or require the satisfactory participation in a drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is so convicted.

6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign the statement, I certify that this firm fully complies with the above requirements.

Bidder's Signature

Gary Deremer, President
U.S. Water Services Corporation
4939 Cross Bayou Blvd., New Port Richey FL 34652
State of Incorporation: Florida

January 12, 2024
Date

PUR062.036
re. 10/97

NON-COLLUSIVE AFFIDAVIT- ITB 2023-03

State of Florida
County of Pasco

Gary Deremer being first duly sworn. deposes and says that he/she is

President of U.S. Water Services Corporation the party making the fore-going submittal of qualifications or bid that such submittal
(partner or officer of the Firm, etc)

Or bid is genuine and not collusive or sham; that said Firm has not colluded, conspired, connived or agreed, directly or indirectly, with any Firm or person, to put in a sham response or to refrain from responding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person, to secure any advantage against the City of Zephyrhills of any person interested in the proposed contract; and that all statements in said response are true.

Officer Gary Deremer, President
State of Incorporation: Florida

U.S. Water Services Corporation *(Company Name)*
4939 Cross Bayou Blvd., New Port Richey FL 34652

State of Florida
County of Pasco

The foregoing instrument was acknowledged before me this 12th day of January 2024
by
Gary Deremer, President *(name and title of corporate officer)*
of U.S. Water Services Corporation *(Name of Corporation),*
a Florida *(state or place of incorporation)* corporation, on behalf of the corporation. He/she is personally known to me or has produced _____ *(Identification type)*
as identification.

Christina R. Crego *(Signature line for notary public)*

Christina R. Crego *(Name of notary type, printed or stamped)*

_____ *(Title or rank)*

My commission expires: January 26, 2025
Serial number, if any _____

CHRISTINA R CREGO
Notary Public-State of Florida
Commission # HH 85112
My Commission Expires
January 26, 2025

Errors or Omissions- ITB 2023-03

Upon review of this project's plans and construction documents are you aware of any apparent errors or omissions?

☐ YES

☒ No

If YES, please provide a detailed explanation of any apparent errors or omissions on this sheet.

January 12, 2024

Company Representative **Date**

Gary Deremer, President
U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652
State of Incorporation: Florida

REFERENCES –PROJECTS OF SIMILAR SCOPE- ITB 2023-03

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: Hernando County BOCC
Project Name: Hill-N-Dale WM Replacement Project Amount: $ 782,593.20
Start Date: 1/31/22 Finished Date: 11/14/23
Description: Installation of new water mains and fire hydrants in the Azen Loop service area of the Hill-n-Dale subdivision to replace the existing aging water mains and abandon the existing water mains and meters that are in the customers back yards and replace them with new water mains and meters that will be installed in the road right-of-way for easier maintenance.
Contact Name: Charles Turner, PM Phone: 352 540 6219
Email: cturner@hernandocounty.us Within Budget: YES ☒ NO ☐*Explain

Reference 2: Company Name: Hernando County BOCC
Project Name: Berkeley Manor Flow Diversion LS Rehab Project Amount: $ 742,165.28
Start Date: 1/13/22 Finished Date: 5/5/23
Description: installation of a new generator. The existing wet well, new valve vault, and new collector manhole will be coated per HCUD specifications Section 9. The station will receive a new electrical service and panel as well. There is approximately 900' of ten inch force main to be installed along with an approximately 170' of eight inch force main under US 19 via directional bore.
Contact Name: Brad Smith, PM Phone: 352 758 4858
Email: bsmith@hernandocounty.us Within Budget: YES ☒ NO ☐*Explain

Reference 3: Company Name: City of Hampton
Project Name: Water Main Loop Project Phase 2 Project Amount: $ 212,298.00
Start Date: 12/16/22 Finished Date: 8/8/23
Description: Loop water mains to improve water conservation, remove dead ends to improve water quality, reduce system flushing, and reduce water age associated with water stagnation at dead ends. New isolation valves to improve the capability to repair line breaks.
Contact Name: Mary Lou Hildreth Phone: 352 468 1201
Email: coh1@outlook.com Within Budget: YES ☒ NO ☐*Explain

Reference 4: Company Name: City of Leesburg
Project Name: FM Installation - Canal Street WWTF Project Amount: $ 96,416.63
Start Date: 8/2/21 Finished Date: 11/9/21
Description: Replacement of a force main from an existing 16-inch ductile iron force main over to a new 16-inch C900 PVC force main. The old ductile iron force main will then be abandoned and shall be grout filled with flowable fill and properly capped.
Contact Name: Ryan Gerdon Phone: 352 705 0248
Email: Ryan.gerdon@leesburgflorida.gov Within Budget: YES ☒ NO ☐*Explain

REFERENCES –PROJECTS OF SIMILAR SCOPE- ITB 2023-03

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: City of Hampton
Project Name: Water Main Loop Project Project Amount: $158,717.59
Start Date: 7/2/21 Finished Date: 9/30/21
Description: Loop water mains to improve water conservation, remove dead ends to improve water quality, reduce system flushing, and reduce water age associated with water stagnation at dead ends. New isolation valves to improve the capability to repair line breaks.

Contact Name: Mary Lou Hildreth Phone: 352 468 1201
Email: coh1@outlook.com Within Budget: YES ☒ NO ☐*Explain

Reference 2: Company Name: City of Leesburg
Project Name: Gravity Main-Pamela Street - 210171 Project Amount: $ 178,931.00
Start Date: 8/2/21 Finished Date: 9/15/21
Description: Relocate existing sewer main. A new sewer main will be constructed and the old sewer main abandoned in place with flowable fill.

Contact Name: Ryan Gerdon Phone: 352 705 0248
Email: Ryan.Gerdon@leesburgflorida.gov Within Budget: YES ☒ NO ☐*Explain

Reference 3: Company Name: City of Waldo
Project Name: CDBG 18 NR Water Main Replacements Project Amount: $ 410,220.35
Start Date: 5/18/20 Finished Date: 3/22/21
Description: The Project consisted of furnishing all labor, equipment, and materials necessary to construct approximately 4,200 LF of 6" PVC water mains, including valves, fittings, fire hydrants, water services, and associated restoration; and the rehabilitation of Lift Station No. 1, including new pumps, piping, control panel, etc.
Contact Name: Timothy Norman, P.E. Phone: 904 278 0030
Email: Tnorman@mittauer.com Within Budget: YES ☒ NO ☐*Explain

Reference 4: Company Name: FGUA
Project Name: Colonial Manor WM Replacement, CSP08 Project Amount: $ 1,566,312.29
Start Date: 10/8/18 Finished Date: 3/11/21
Description: Replace approx' 8,504 LF of WM in the Colonial Manor development. Installation of new WM within the ROW, installation of new service connections, relocation of existing meters to be installed in new meter boxes, removal of existing meter boxes, installation of new service laterals, installation of fire hydrants, and grouting in place existing water mains (4" and greater only). Surveys, maintenance of traffic, sodding and site restoration.
Contact Name: Robert Dickson, P.E. Phone: 407 629 6900
Email: rdickson@govmserv.com Within Budget: YES ☒ NO ☐*Explain

REFERENCES –FOR CURRENTLY ACTIVE PROJECTS- ITB 2023-03

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: FGUA (Florida Governmental Utility Authority)
Project Name: 180th Ave Package Plant Abatement Project Amount: $ 706,474.00
Start Date: 8/7/2023 Finished Date: in progress
Description: Work of the Project includes construction of approximately 2,220 liner feet (LF) of 4-inch force main by open trench excavation and 500 linear feet (LF) of force main by horizontal directional drilling (HDD)

Contact Name: Jordan Jayashekaramurthy, CPM GSG Phone: 407 629 6900
Email: jodanjay@govmserv.com Within Budget: YES ☒ NO ☐ *Explain

Reference 2: Company Name: FGUA (Florida Governmental Utility Authority)
Project Name: Jungle Den Inflow & Infiltration Correction and LS Upg Project Amount: $ 2,582,935.00
Start Date: 6/6/2023 Finished Date: in progress
Description: see following page

Contact Name: Robert Gonzalez, P.E. Phone: 407 425 0452
Email: rgonzalez@cphcorp.com Within Budget: YES ☒ NO ☐ *Explain

Reference 3: Company Name: Pasco County BOCC
Project Name: Pasco Aqua Utility System Improvements Project Amount: $ 3,996,354.14
Start Date: 10/25/22 Finished Date: in progress
Description: see following page

Contact Name: Kurt Heath, P.E. Phone: 813 760 1964
Email: Kurt@stroudengineering.com Within Budget: YES ☒ NO ☐ *Explain

Reference 4: Company Name: City of Casselberry
Project Name: PW 2007 Sausalito FM Replacement Project Amount: $ 1,501,270.90
Start Date: 6/27/22 Finished Date: in progress
Description: Install approx 6,000 LF of 10-inch FM consisting of; Repair sidewalk, driveway and asphalt road; Coordinate with City to re-direct flow from existing lift stations (open and closing valves), in order to have existing FM without flow; Restoration of site landscaping, irrigation, roadway and other affected facilities; Connection to existing Lift Station piping and existing Force Main on South Winter Park Drive;
Contact Name: Stefano Ceriana Phone: 407 917 5697
Email: sceriana@chacompanies.com Within Budget: YES ☒ NO ☐ *Explain

Ref #2
- Relocate LS 01: One (1) 8 ft dia. wet well with dual pumps, valves above ground, new electrical panel and generator on-site. Connect gravity sewer and force main: one (1) MH, approx 446 LF of 8-inch PVC gravity main and approx 56 LF of 4-inch PVC force main to be connected to 6-inch PVC at the WWTF Headworks.
- Relocate LS 02: One (1) 6 ft dia. wet well with dual pumps, valves above ground, new electrical panel. Connect gravity sewer and force main: two (2) MHs, approx 225 LF of 8-inch PVC gravity main, approx 25 LF of 4-inch PVC force main and extend approx 60 LF of 6-inch PVC lateral for Condominiums to the new MH.
- Repair and replace gravity sewer: At Jungle Den Villas Condominiums install approx 279 LF of 8-inch PVC gravity main and add one (1) MH to relocate the gravity sewer into the existing utility easement. On Juno Trail Road, Alice Drive and River Road line and repair approx 3,000 LF of gravity
Ref #3
At the Jasmine Lakes community, installation of a new sewer conveyance and pumping system, including a new duplex lift station, 710 linear feet of 6-inch diameter PVC force main piping, and 470 linear feet of 8-inch diameter PVC force main piping by open cut methods. The force main piping work requires the removal of abandoned utility piping, including 900 linear feet of 12-inch diameter PVC piping and 800 linear feet of 8-inch diameter asbestos cement piping. Upon completion and activation of the new pumping system, the existing wastewater treatment facility shall be abandoned and demolished. The work shall also include installation of a new primary and secondary potable water connection for the community, including 690 linear feet of 8-inch diameter PVC water main piping by open cut methods and two (2) aboveground meter and control valve assemblies. At the Palm Terrace community, installation of a new gravity sewer collection and pumping system, including 250 linear feet of gravity sewer piping, four (4) manholes, a new duplex lift station, 1,710 linear feet of 6-inch diameter PVC force main piping by open cut methods, and 2,140 linear feet of 6-inch diameter HDPE force main piping by horizontal directional drilling methods along Ranch Road, with three (3) separate drill lengths. Upon completion and activation of the new pumping system, the existing wastewater treatment facility shall be abandoned and demolished. The work shall also include installation of a new secondary potable water connection for the community, including 140 linear feet of 6-inch diameter PVC water main piping and an aboveground meter and control valve assembly. At the Zephyr Shores community, installation of a new primary and secondary potable water connection for the community, including 200 linear feet of 6-inch diameter PVC water main piping, 120 linear feet of 8-inch diameter PVC water main piping, 50 linear feet of 16-inch diameter steel casing by jacking and boring methods, an aboveground meter and backflow prevention assembly, and an aboveground meter and control valve assembly

REFERENCES –FOR CURRENTLY ACTIVE PROJECTS- ITB 2023-03

Within the last five (5) years-Minimum 5 references

Reference 1: Company Name: American Beach Water and Sewer District
Project Name: Well and Septic Tank Phase Out Program Project Amount: $ 7,831,538.00
Start Date: 6/6/2022 Finished Date: in progress
Description: The project includes the installation of approximately 12,400 linear feet of 8" PVC gravity pipe within the existing American Beach community via open-cut installation. (additional information at the bottom of page)

Contact Name: Teresa Irby-Butler, P.E. Phone: 407 629 6900
Email: teresa.irby-butler@fgua.com Within Budget: YES ☒ X NO ☐ *Explain

Reference 2: Company Name: _____
Project Name: _____ Project Amount: $ _____
Start Date: _____ Finished Date: _____
Description: _____

Contact Name: _____ Phone: _____
Email: _____ Within Budget: YES ☐ NO ☐ *Explain

Reference 3: Company Name: _____
Project Name: _____ Project Amount: $ _____
Start Date: _____ Finished Date: _____
Description: _____

Contact Name: _____ Phone: _____
Email: _____ Within Budget: YES ☐ NO ☐ *Explain

Reference 4: Company Name: _____
Project Name: _____ Project Amount: $ _____
Start Date: _____ Finished Date: _____
Description: _____

Contact Name: _____ Phone: _____
Email: _____ Within Budget: YES ☐ NO ☐ *Explain

A. The project includes the installation of approximately 12,400 linear feet of 8" PVC gravity pipe within the existing American Beach community via open-cut installation. The open cut will occur in the center of each roadway as identified in the contract drawings. Installation of the gravity sewer system includes the installation of approximately 42 precast concrete manholes, pipe fittings, and sewer laterals to the edge of the right of way. Manhole interior and exterior surfaces shall be coated per JEA standards.
B. The proposed gravity sewer system includes the installation of two new lift stations. Each lift station shall be equipped with submersible pumps, control panels, level control, and mission communications as identified in the contract drawings. The lift station wet wells shall be coated and lined per JEA standards.
C. The proposed sewer system includes approximately 2,600 linear feet of 4-inch PVC force main and associated appurtenances as shown on the contract drawings. All materials and protective linings and coatings for corrosion protection shall abide by JEA standards.
D. Sewer service laterals shall be provided to the parcels shown on the contract drawings. Installation of sewer service laterals shall be within the public right-of-way and shall terminate at the private property lines with above grade, visible demarcation per JEA
standard details.
E. The proposed potable water main system includes the installation of approximately 12,300 linear feet new PVC pipe via open-cut installation. Pipe diameters will be 4-inch, 6-inch, and 8-inch as shown on the contract drawings. Installation of the potable water main system includes approximately 16 fire hydrants, approximately 287 service laterals, water meter boxes at all occupied parcels, and water main isolation valves and boxes.
F. Contractor shall be responsible for the relocation of gopher tortoises within the project boundaries and as required by all applicable permits.
G. Roadways shall be resurfaced at the conclusion of the project and to the extent as identified on the contract drawings. Contractor shall be responsible for maintenance of traffic during the entire duration of the project.

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion Form- ITB 2023-03

1. The prospective Vendor, U.S. Water Services Corporation, certifies, by submission of this document, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any Federal Department or Agency.

2. Where the Vendor is unable to certify to the above statement, the prospective Vendor shall attach an explanation to this form.

Vendor: U.S. Water Services Corporation
Name of Company – Please Print

Signature: 
Authorized Company Representative

Name/Title: Gary Deremer, President

Address: 4939 Cross Bayou Blvd.,
New Port Richey FL 34652
State of Incorporation: Florida

Date: January 12, 2024

CERTIFICATION OF CONTRACTOR REGARDING TRENCH SAFETY- ITB 2023-03

This certification is required pursuant to the Trench Safety Act, Chapter 90-98, Florida Statutes regarding Trench Safety. The Act specifically incorporates the Occupational Safety and Health Administration's excavation safety standards, 29 CFR S. 1928.650 Subpart P as the State standard. Any revision to OSHA's safety standards that are consistent with the Florida Statues shall also be complied with upon its effective date. The act requires that any bidder or prospective contractor, or any of their proposed subcontractors, shall provide written assurance that the contractor will comply with the applicable trench safety standards.

Name of Contractor: U.S. Water Services Corporation

Address: 4939 Cross Bayou Blvd.,

New Port Richey FL 34652

Phone: 727 848 8292

1. Contractor agrees that he is aware of the Trench Safety Act and the requirements of the Act.
2. Contractors agrees to comply with all applicable trench safety standards as set forth in the Act and as referenced in the Act.

Name of Signer: Gary Dermer
PLEASE PRINT

Title: President

Signature:

Date: January 12, 2024

U.S. Water Services Corporation
4939 Cross Bayou Blvd.,
New Port Richey FL 34652
State of Incorporation: Florida

Ron DeSantis, Governor

Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE UNDERGROUND UTILITY & EXCAVATION CO HEREIN IS CERTIFIED UNDER THE PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

DEREMER, GARY ANDREW

US WATER SERVICES CORPORATION
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY FL 34652

LICENSE NUMBER: CUC1223914

EXPIRATION DATE: AUGUST 31, 2024

Always verify licenses online at MyFloridaLicense.com

Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.

Ron DeSantis, Governor

Melanie S. Griffin, Secretary

STATE OF FLORIDA
DEPARTMENT OF BUSINESS AND PROFESSIONAL REGULATION

CONSTRUCTION INDUSTRY LICENSING BOARD

THE GENERAL CONTRACTOR HEREIN IS CERTIFIED UNDER THE
PROVISIONS OF CHAPTER 489, FLORIDA STATUTES

DELCHER, CECIL R

U S WATER SERVICES CORPORATION
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY FL 34652

LICENSE NUMBER: CGC003307

EXPIRATION DATE: AUGUST 31, 2024

Always verify licenses online at MyFloridaLicense.com

Do not alter this document in any form.

This is your license. It is unlawful for anyone other than the licensee to use this document.

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

▶ **Go to *www.irs.gov/FormW9* for instructions and the latest information.**

Give Form to the requester. Do not send to the IRS.

Print or type. See **Specific Instructions** on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

U.S. Water Services Corporation

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☑ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

4939 Cross Bayou Boulevard

Requester's name and address (optional)

6 City, state, and ZIP code

New Port Richey, FL 34652

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN,* later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

			–			–				

or

Employer identification number

2	0	–	0	0	8	8	2	1

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here Signature of U.S. person ▶ Edward Mukeen Date ▶ 02/28/2019

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9.*

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

FLORIDA DEPARTMENT of STATE DIVISION OF CORPORATIONS

Sunbiz.org DIVISION of CORPORATIONS an official State of Florida website

Department of State / Division of Corporations / Search Records / Search by Entity Name /

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us water services

Search

Events **No Name History**

Detail by Entity Name

Florida Profit Corporation
U.S. WATER SERVICES CORPORATION

Filing Information

Document Number	P03000047833
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Effective Date	04/28/2003
State	FL
Status	ACTIVE
Last Event	AMENDED AND RESTATED ARTICLES
Event Date Filed	03/31/2020
Event Effective Date	NONE

Principal Address

4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Changed: 03/31/2004

Mailing Address

4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Changed: 05/09/2005

Registered Agent Name & Address

DEREMER, GARY A
4939 CROSS BAYOU BOULEVARD

NEW PORT RICHEY, FL 34652

Name Changed: 03/31/2020

Address Changed: 03/31/2020

Officer/Director Detail

Name & Address

Title CEO

DEREMER, GARY
4939 CROSS BAYOU BLVD.
NEW PORT RICHEY, FL 34652

Title VP

DELCHER, CECIL
4939 CROSS BAYOU BLVD.
NEW PORT RICHEY, FL 34652

Title VP

AMIOTT, RALPH
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

KADER, MOHAMMED
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP, Secretary

Mitchell, Edward
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title CFO

RUPE, KAYCEE
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

SALIBA, CHRIS
4939 CROSS BAYOU BOULEVARD

NEW PORT RICHEY, FL 34652

Title VP

RENDELL, WILLIAM TROY
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

DUPONT, JEFFREY
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

VOSS, AARON
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title SVP

Elias, Dan
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title SVP

Jones, Kenneth
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

Benderski, Ron
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Title VP

SCHULTZ, DAVID, Jr.
4939 CROSS BAYOU BOULEVARD
NEW PORT RICHEY, FL 34652

Annual Reports

Report Year	Filed Date
2021	01/20/2021
2022	01/24/2022

2023	01/11/2023

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us water services
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Events **No Name History**

City Council Meeting
February 26, 2024

Action Item

CONSENT ITEMS 2.7

Approval of Task Assignment to RCM Utilities for Water Tower Valve Replacements

Issue:

Requesting Council's approval to replace two (2) underground 12" valves that do not close properly.

Background:

This project is to replace two (2) underground 12" valves that do not close properly. These are needed to isolate the elevated storage tank and the ground storage tank so they can be drained for inspection and maintenance. They both leak during these events and cause issues with the tank maintenance company. Especially during times when painting needs to be completed. It is also to replace six (6) 8" valves inside the booster pumping station building that also do not close tight either, and are very difficult to operate. These valves are needed to isolate the 3 booster pumps, motors, and check valves. These 6 valves would need to be changed to have the pumps, motors, and check valves replaced.

Attachment(s):

1. Zephyrhills Valve Task Authorization
2. Zephyrhills Water Tower Valve LERF

Fiscal Impact:

The Task Assignment amount is $63,518.44 and funded from the approved FY24 budget.

Staff Recommendation:

Staff recommends the City Council approve the Task Assignment as presented.

February 16, 2024

To: City of Zephyrhills
RE: Water Tower Valve Replacement

- Purpose
  - Task authorization for construction services as requested from CJ Funnell for the valve replacement at the Water Tower.
- Compensation and Contract
  - A budget for the work as stated totaling $63,518.44 has been submitted on the Annual City of Zephyrhills water and wastewater miscellaneous construction and maintenance services contract RFP (35-19-01)
- Scope
  - Please refer to Estimate #4594

Owner:

City of Zephyrhills

By:_____

_____

Contractor:

RCM Utilities, LLC

Christopher R Creech

Water & Wastewater Misc Construction/Maintenance Services
Labor/Equipment Rates Form

Customer: City of Zephyrhills **Project:** Water Tower Valves Replacement

LABOR RATES	RATES		ENTER	SUBTOTAL	ENTER	SUBTOTAL		LINE ITEM TOTAL
	WORKING HOURS	AFTER HOURS	# WORKING HOURS	# WORKING HOURS	# AFTER HOURS	# AFTER HOURS		
Supervisor	$ 50.00	$ 75.00	30	$ 1,500.00		$ -		$ 1,500.00
Foreman	$ 75.00	$ 113.00	60	$ 4,500.00		$ -		$ 4,500.00
Helper - Labor Only	$ 35.00	$ 53.00	60	$ 2,100.00		$ -		$ 2,100.00
Helper with Truck/Trailer	$ 50.00	$ 75.00	60	$ 3,000.00		$ -		$ 3,000.00
Backflow Technician	$ 40.00	$ 60.00		$ -		$ -		
							LABOR RATES TOTAL	**$ 11,100.00**

Please provide when after hours would apply (anytime outside of Mon - Fri 7am - 5pm)

EQUIPMENT RATES	SET UP FEE	HOURLY	# OF HOURS/ GALLONS or BAGS	DAILY	# OF DAYS	WEEKLY	# OF WEEKS	MONTHLY	# OF MONTHS	LINE ITEM TOTAL
Mini Excavator with Operator	$ 150.00	$ 80.00	30.00	$ 800.00		$ 2,400.00		$ 9,600.00		**$ 2,550.00**
Back Hoe with Operator	$ 250.00	$ 125.00		$ 1,250.00		$ 6,250.00		$ 25,000.00		
Vac Truck - 2 Man Crew	$ 250.00	$ 280.00		$ 2,800.00		$ 14,000.00		$ 56,000.00		
CCTV Camera Trailer with Operator	$ 250.00	$ 175.00		$ 1,750.00		$ 8,750.00		$ 35,000.00		
Tractor with Bucket with Operator	$ 250.00	$ 125.00		$ 1,250.00		$ 6,250.00		$ 25,000.00		
4" Sewage Bypass Pump with Hoses	$ 250.00	$ 40.00		$ 250.00		$ 650.00		$ 2,600.00		
Bypass Pump Fuel Additional	$ 4.50	Per Gallon								
13000 Watt Generator	$ 250.00	$ 40.00		$ 170.00		$ 850.00		$ 3,400.00		
Infiltrator MH Leak Stop Plus Labor	$ 150.00	$ 250.00		$ 150.00		$ 750.00		$ 3,000.00		
Metal Fabrication/Welding Lead Man	$ 150.00	$ 75.00		$ 750.00		$ 3,750.00		$ 15,000.00		
Metal Fabrication/Welder	$ 150.00	$ 65.00		$ 650.00		$ 3,250.00		$ 13,000.00		
Sand Blast Trailer Rig with Crew	$ 250.00	$ 295.00		$ 2,950.00		$ 14,750.00		$ 59,000.00		
Sand Blasting Sand	$ 5.00	Per Bag								
Compactor with Operator	$ 150.00	$ 100.00	10.00	$ 1,000.00		$ 5,000.00		$ 20,000.00		**$ 1,150.00**
Air Compressor Road Bore	$ 250.00	$ 125.00		$ 1,250.00		$ 6,250.00		$ 25,000.00		
									EQUIPMENT RATES TOTAL	**$ 3,700.00**

MATERIAL RATES	% Mark UP	COST	MARK-UP	LINE ITEM TOTAL
Materials Purchased for Specific Job	25%	38974.75	$ 9,743.69	$ 48,718.44
Materials from Stock	25%		$ -	
Subcontract Labor	20%		$ -	
			MATERIAL RATES TOTAL	**$ 48,718.44**
			SUBTOTAL	**$ 63,518.44**
PERFORMANCE & PAYMENT BOND	(Yes/No)	No	2%	$ -
			GRAND TOTAL	**$ 63,518.44**

Company Name: RCM Utilities, LLC

Authorized Representative/ Title: Christopher R. Creech, Mgr.

Signature: Christopher R. Creech Date: _____

City Council Meeting
February 26, 2024

Action Item

CONSENT ITEMS 2.8

Approval of Task Assignment to RCM Utilities for Water Tower Motor and Pump Replacement

Issue:

Original motors, pumps and check valves from the construction of the tower in 1989.

Background:

This project is to have the pumps, motors, and check valves replaced due to them being the original ones from 1989, when the site was built. We try to be proactive and not wait for failures/emergencies to arise.
Additionally, the new motors will be much more energy efficient, in turn, potentially saving electric costs.

Attachment(s):

1. Zephyrhills Task Authorization Pump and Motor
2. Zephyrhills Pump & Motor LERF

Fiscal Impact:

The cost of this project is $103,406.94 and will come from the approved FY24 budget.

Staff Recommendation:

Staff recommends to the City Council to approve this Task Authorization as presented.

February 16, 2024

To: City of Zephyrhills
RE: Water Tower Pump and Motor Replacement

- Purpose
  - Tast authorization for construction services as requested from CJ Funnell for the Pump and Motor Replacement at the Water Tower.
- Compensation and Contract
  - A budget for the work as stated totaling $103,406.94 has been submitted on the Annual City of Zephyrhills water and wastewater miscellaneous construction and maintenance services contract RFP (35-19-01)
- Scope
  - Please refer to Estimate #4590

Owner:

City of Zephyrhills

By:_____

_____

Contractor:

RCM Utilities, LLC



Christopher R Creech

Water & Wastewater Misc Construction/Maintenance Services
Labor/Equipment Rates Form

Customer: City of Zephyrhills **Project:** Water Tower Pump and Motor Replacement

LABOR RATES	RATES		ENTER	SUBTOTAL	ENTER	SUBTOTAL		LINE ITEM TOTAL
	WORKING HOURS	AFTER HOURS	# WORKING HOURS	# WORKING HOURS	# AFTER HOURS	# AFTER HOURS		
Supervisor	$ 50.00	$ 75.00	50	$ 2,500.00		$ -		$ 2,500.00
Foreman	$ 75.00	$ 113.00	40	$ 3,000.00		$ -		$ 3,000.00
Helper - Labor Only	$ 35.00	$ 53.00	40	$ 1,400.00		$ -		$ 1,400.00
Helper with Truck/Trailer	$ 50.00	$ 75.00	40	$ 2,000.00		$ -		$ 2,000.00
Backflow Technician	$ 40.00	$ 60.00		$ -		$ -		
							LABOR RATES TOTAL	**$ 8,900.00**

Please provide when after hours would apply (anytime outside of Mon - Fri 7am - 5pm)

EQUIPMENT RATES	SET UP FEE	HOURLY	# OF HOURS/ GALLONS or BAGS	DAILY	# OF DAYS	WEEKLY	# OF WEEKS	MONTHLY	# OF MONTHS	LINE ITEM TOTAL
Mini Excavator with Operator	$ 150.00	$ 80.00		$ 800.00		$ 2,400.00		$ 9,600.00		
Back Hoe with Operator	$ 250.00	$ 125.00		$ 1,250.00		$ 6,250.00		$ 25,000.00		
Vac Truck - 2 Man Crew	$ 250.00	$ 280.00		$ 2,800.00		$ 14,000.00		$ 56,000.00		
CCTV Camera Trailer with Operator	$ 250.00	$ 175.00		$ 1,750.00		$ 8,750.00		$ 35,000.00		
Tractor with Bucket with Operator	$ 250.00	$ 125.00		$ 1,250.00		$ 6,250.00		$ 25,000.00		
4" Sewage Bypass Pump with Hoses	$ 250.00	$ 40.00		$ 250.00		$ 650.00		$ 2,600.00		
Bypass Pump Fuel Additional	$ 4.50	Per Gallon								
13000 Watt Generator	$ 250.00	$ 40.00		$ 170.00		$ 850.00		$ 3,400.00		
Infiltrator MH Leak Stop Plus Labor	$ 150.00	$ 250.00		$ 150.00		$ 750.00		$ 3,000.00		
Metal Fabrication/Welding Lead Man	$ 150.00	$ 75.00	30.00	$ 750.00		$ 3,750.00		$ 15,000.00		**$ 2,400.00**
Metal Fabrication/Welder	$ 150.00	$ 65.00		$ 650.00		$ 3,250.00		$ 13,000.00		
Sand Blast Trailer Rig with Crew	$ 250.00	$ 295.00		$ 2,950.00		$ 14,750.00		$ 59,000.00		
Sand Blasting Sand	$ 5.00	Per Bag								
Compactor with Operator	$ 150.00	$ 100.00		$ 1,000.00		$ 5,000.00		$ 20,000.00		
Air Compressor Road Bore	$ 250.00	$ 125.00		$ 1,250.00		$ 6,250.00		$ 25,000.00		
									EQUIPMENT RATES TOTAL	**$ 2,400.00**

MATERIAL RATES	% Mark UP	COST	MARK-UP	LINE ITEM TOTAL
Materials Purchased for Specific Job	25%	73685.55	$ 18,421.39	$ 92,106.94
Materials from Stock	25%		$ -	
Subcontract Labor	20%		$ -	
			MATERIAL RATES TOTAL	**$ 92,106.94**
			SUBTOTAL	**$ 103,406.94**
PERFORMANCE & PAYMENT BOND	(Yes/No)	No	2%	$ -
			GRAND TOTAL	**$ 103,406.94**

Company Name: RCM Utilities, LLC

Authorized Representative/ Title: Christopher R. Creech, Mgr.

Signature: Christopher R. Creech Date: _____

City Council Meeting
February 26, 2024

Action Item

CONSENT ITEMS 2.9

Approval of Grant Administration Professional Services Agreement No. 37-24-02 - Audrey McGuire

Issue:

The City of Zephyrhills has several grants and state appropriations for Police, Utilities, Planning, and Public Works. Audrey McGuire previously handled grant administration for the City. When she took other employment, the grant administration duties moved to the Finance Department. Staff attempted to fill a position that would, among other duties, handle grant administration. We were unsuccessful in filling the position.

Background:

Staff recommends approving the three (3) year agreement with Audrey McGuire for grant administration services. Ms. McGuire has knowledge of our grants and relationships with the state agencies which issued the grants.

The agreement provides for:

- The City will compensate Ms. McGuire $500 at the beginning of each year and then $50/hour. The hourly work will not exceed $5,000 in a single year;
- Grant Administrator will prepare reports, invoices and supporting documentation in compliance with funding requirements;
- Coordinates with department heads to ensure compliance and project efficiency;
- Obtain and maintain copies of the City's current grant contracts;
- Prepare status updates as required by each funding agreement;
- Prepare all disbursement requests;
- Assist in the preparation of contract revisions and supporting documents;
- Prepare closeout documents.

Attachment(s):

1. Grant Administration Professional Services Independent Contractor Agreement No. 37-24-02- Audrey McGuire

Fiscal Impact:

The fiscal term of the agreement will not exceed $5,500.00 in a single year.

Staff Recommendation:
Staff recommends approval of agreement 37-42-02.

GRANT ADMINISTRATION PROFESSIONAL SERVICES
INDEPENDENT CONTRACTOR AGREEMENT NO: 37-42-02

This Independent Contractor Agreement ("Agreement") is made between **the City of Zephyrhills, Florida, a municipal corporation** ("City") and **Audrey McGuire** ("Contractor"), entered into and effective on this 26th of February, 2024 ("Effective Date").

WHEREAS, Contractor desires to provide grant administration services ("Contractor's Services") under the legal relationship of an independent contractor and the City desires to engage Contractor as an independent contractor pursuant to the terms of this Agreement;

NOW, THEREFORE, in consideration of the promises and mutual covenants contained herein, and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. **TERM:**

This Agreement shall commence on the Effective Date and shall continue for three (3) years unless terminated by either party pursuant to Section 8 of this Agreement.

2. **PAYMENT:**

2.1 Prior to Effective Date, Contractor must execute the W-9 Form attached hereto.

2.2 City agrees to compensate Contractor a yearly $500.00 payment at the beginning of the term and further compensate Contractor at the rate of $50.00/hour. The total sum of the hourly work to be performed under this agreement shall not exceed five-thousand $5,000.00 in a single fiscal year.

2.3 Contractor will invoice City on the last day of each week, for all of the Contractor's Services performed that prior week. Payment shall be made by City to the Contractor the following week after Contractor delivers invoice to City.

2.4 Contractor understands that Contractor shall not be entitled to any other form of compensation or benefits from City.

3. **SCOPE OF WORK/REPRESENTATIONS:**

City is engaging Contractor to provide services of Grant Administrations. Contractor represents that Contractor has the necessary experience and skills to effectively perform as an independent contractor. Contractor shall perform Contractor's duties in a professional manner and to the best of Contractor's ability. At all times, Contractor shall conduct Contractor's business in a reputable and ethical manner, in conformance with all laws, rules, and regulations. A detailed scope of work is attached hereto as Exhibit "A" and by reference made apart hereof.

4. **INDEPENDENT CONTRACTOR RELATIONSHIP:**

4.1 The parties expressly acknowledge and agree that the services of Contractor will

be rendered as an independent contractor. Contractor shall not be considered an employee of City. In this regard, the parties hereto agree as follows:

(a) Contractor maintains control over the method and means of delivering the services provided and is responsible for the performance of such services;

(b) Contractor is not required to perform services in any order or sequence;

(c) Contractor is not required to furnish any oral or written reports to City, expect as required by law;

(d) Contractor shall be responsible for paying for all of Contractor's expenses, including but not limited to all required insurance, licensure and continuing education expenses, incurred in the course of performing any services covered by this Agreement or required in order for Contractor to lawfully provide the services covered by this Agreement;

(e) Contractor shall obtain, pay, and provide proof of coverage for professional liability insurance in an amount required by City and name of City as an additional insured as to any such insurance policies;

(f) Contractor shall pay all income, FICA and other taxes for her/himself and any of Contractor's employees, agents or independent contractors (if any), and City shall not withhold any money from the Contractor's payments for such purposes;

(g) Contractor shall pay all unemployment insurance tax contributions and workers' compensation premiums on behalf of Contractor's employees, agents or independent contractors (if any) and City shall not withhold any money from the Contractor's payments for such purposes;

(h) Any equipment and supplies needed by Contractor to perform services pursuant to this Agreement shall be provided by Contractor;

(i) If required by Florida law, Contractor shall purchase and secure any necessary workers' compensation insurance and unemployment compensation coverage required for Contractor or Contractor's employees, agents or independent contractors (if any);

(j) Contractor and Contractor's employees, agents or independent contractors (if any) shall have no authority to bind City or any of its officers, members or employees; and

(k) Contractor and Contractor's employees, agents or independent contractors (if any) shall have no claim against City hereunder or otherwise for vacation pay, sick leave, retirement benefits, social security, workers' compensation, health or disability benefits, unemployment insurance benefits or employee benefits of any kind.

(l) Contractor agrees to indemnify and hold City harmless from any such items, payments or any liability arising from Contractor's failure to comply with Paragraphs (a) through (l) above.

5. **NON-EXCLUSIVE AGREEMENT:**

It is agreed by the parties hereto that this is not an exclusive agreement and that City has the right to use or contract for the use of similar services from other contractors or providers. Likewise, Contractor and Contractor's employees, agents and independent contractors have the right to provide and contract to provide similar services to other registries/providers/patients/clients, provided such services are not in violation of the confidentiality provision contained herein. It is further understood that no promises or representations whatsoever have been made as to the potential amount of business Contractor can expect at any time during the term of this Agreement.

6. **INDEMNIFY AND HOLD HARMLESS:**

Without regard to the fault or negligence of any party, Contractor hereby unconditionally indemnifies, holds harmless, protects and agrees to defend City and its affiliates and each of their owners, franchisees, trustees, officers, employees and agents (collectively referred to as "Indemnified Parties") from and against any and all claims, demands, damages, losses or liabilities of whatever nature (including, but not limited to, liability to third-parties, fines, penalties and attorneys' fees, costs and expenses) and all other consequences of any sort, whether known or unknown, without limit and without regard to the cause or causes thereof which arise from: (a) Contractor's breach of this Agreement; (b) the services provided by Contractor to City; (c) the acts or omissions of Contractor or Contractor's employees, agents or independent contractors; (d) injuries or damages claimed under workers' compensation or similar acts by Contractor or the Contractor's employees, agents or independent contractors; and (e) all other lawsuits, claims, investigations or other proceedings claiming or alleging that Contractor or Contractor's employees, agents or independent contractors are employees of City. If any lawsuit, audit, investigation or other proceeding is brought against the Indemnified Parties, the Indemnified Parties shall provide written notice to Contractor of such proceeding. Within fifteen (15) days of such notice, Contractor shall assume defense of the proceeding, at its expense, with counsel selected by the Indemnified Parties.

7. **ASSIGNMENT:**

Contractor shall not assign any rights of this Agreement, or any other written instrument related to Contractor's Services provided under this Agreement, and no assignment shall be binding without the prior written consent of City. Subject to the foregoing, this Agreement will be binding upon the Parties' heirs, executors, successors and assigns.

8. **TERMINATION:**

Either party may terminate this Agreement, at any time, for any reason, by providing the other party with thirty (30) days written notice.

9. **CONSEQUENCES OF TERMINATION:**

The last day of the independent contractor relationship shall be referred to as the "Termination Date." Within seven (7) days after the Termination Date, Contractor shall deliver to City its final invoices reflecting services rendered (as described in Paragraph 8, above) ("Final Statement") and City shall, within thirty (30) days after receipt of the Final Statement, pay to Contractor any accrued but unpaid fees for service rendered through the Termination Date, including but not limited to those reflected on the Final Statement, and thereafter no further compensation shall be due from or owed by City to Contractor.

10. **MISCELLANEOUS:**

10.1 The waiver by any party of a breach of any provision of this Agreement shall not operate or be construed as a waiver of any subsequent breach by any party.

10.2 Any notices given under this Agreement shall be sufficient if in writing and sent by registered or certified mail to the party entitled thereto.

10.3 This Agreement, and all of the terms and conditions hereof, shall be construed and interpreted in accordance with the laws of the State of Florida.

10.4 Venue for any litigation arising hereunder shall be in Circuit Court in and for Pasco County.

11. **SURVIVAL OF TERMS:**

The covenants, agreements, representations and warranties contained in Sections 4 through 10 shall survive termination of this Agreement.

12. **SEVERABILITY:**

The invalidity or unenforceability of any particular provision of this Agreement shall not affect the other provisions hereto and this Agreement shall be construed in all respects as though such invalid or unenforceable provisions were omitted.

13. **PUBLIC RECORDS**:

IF THE CONSULTANT/CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONSULTANT'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT 813-780-0000, EXT. 3543 OR CITYCLERK@CI.ZEPHYRHILLS.FL.US OR CITY CLERK, CITY OF ZEPHYRHILLS, 5335 EIGHTH STREET, ZEPHYRHILLS, FLORIDA 33542.

14. **ENTIRE AGREEMENT:**

This document contains the entire agreement between the parties with respect to the subject matter hereof, supersedes any previous understanding, commitments or agreements, oral

or written, and may not be amended except by an agreement in writing, signed by the parties hereto.

IN WITNESS WHEREOF, the parties knowingly and voluntarily enter this Agreement.

AUDREY MCGUIRE

_____

Date:_____

CITY OF ZEPHYRHILLS, FLORIDA

By: _____
Lance A. Smith

Its: Council President

Date: February 26, 2024

EXHIBIT A
GRANT ADMINISTRATION SERVICES

STATEMENT OF WORK

1. SCOPE - The Grant Administrator shall prepare reports, invoices and supporting documentation in compliance with funding requirements. The Grant Administrator coordinates with department administrators to ensure compliance and project efficiency. Depending on the complexity of data requirements for each funding contract, the Grant Administrator creates and distributes standard and special reports, summaries and invoices as required by the grant contract and the City.

2. SERVICES - The Grant Administrator shall perform the following tasks and duties:
    1. Obtain and maintain copies of the City's current grant contract(s), including all related change requests, revisions and attachments.
    2. Coordinate, as necessary, between the City department administrators, appropriate service providers (i.e., engineer, contractor, etc.) and the Granting Agency to provide services as requested.
    3. Ensure compliance with regulations, policies and conditions of the funding agreement.
    4. Prepare status updates and reports annually or quarterly based on timelines identified in the funding agreement.
    5. Prepare all required disbursement requests/invoices based on deliverables and/or timelines identified in the funding agreement.
    6. Assist in the preparation of contract revisions and supporting documents including, but not limited to, amendments/modifications and change orders.
    7. Prepare closeout documents.

City Council Meeting
February 26, 2024

Action Item

CONSENT ITEMS 2.10

Canine Transfer of Ownership

Issue:

Retire Canine Jax and transfer ownership to Sergeant Morris Sparkman

Background:

Due to advanced age, recurring health issues, and the recent promotion of his handler, the department has decided to retire Canine Jax.

Attachment(s):

1. Sparkman CANINE OWNERSHIP TRANSFER AGREEMENT

Fiscal Impact:

None

Staff Recommendation:

Staff recommends transfer of ownership.

CANINE OWNERSHIP TRANSFER AGREEMENT

THIS CANINE OWNERSHIP TRANSFER AGREEMENT is made this 26th day of February 2024 by and between the CITY OF ZEPHYRHILLS, FLORIDA (hereinafter "CITY") and MORRIS SPARKMAN, an officer of the Zephyrhills Police Department (hereinafter "OFFICER").

WITNESSETH:

WHEREAS, CITY currently has within its K-9 corps a certain canine named "JAX," hereafter referred to as "CANINE," and

WHEREAS, CITY desires to retire CANINE from active service with its police department and

WHEREAS, OFFICER was the sole handler assigned to CANINE, who cared for and maintained CANINE in OFFICER'S home during off-duty hours and

WHEREAS, OFFICER desires and has requested the CITY transfer ownership of, and complete responsibility for, CANINE to OFFICER and

WHEREAS, CITY is willing to transfer ownership of, and complete responsibility for, CANINE to OFFICER, provided OFFICER is willing to defend, hold harmless, and indemnify CITY, its officers, and employees from any and all loss, injury, or damage caused by CANINE after the effective date of this agreement.

NOW, THEREFORE, the parties agree as follows:

1. CITY shall transfer sole ownership of, and complete responsibility for, CANINE to OFFICER on February 26, 2024.

2. In consideration of the transfer, OFFICER accepts sole ownership of, and complete responsibility for, CANINE, including responsibility for the maintenance, health care, supervision, and control of CANINE, without reimbursement or compensation from CITY.

3. Further, in return for CITY'S conveying ownership of CANINE to OFFICER, OFFICER warrants that he will defend and hold harmless CITY, its officers, and employees from any and all claims for injury or damage of whatever kind, caused or alleged to have been caused by CANINE after the date of transfer set forth herein, whether OFFICER or any other person, is deemed negligent or alleged to have been negligent or not.

4. OFFICER further warrants that he will indemnify CITY, its officers, and employees for any loss (including costs, expenses, and attorney fees) that CITY, its officers, or employees may suffer as a result of the claims mentioned in Paragraph 3.

5. The parties further agree that CITY is relying on these representations by OFFICER in agreeing to this transfer and that, but for said representations, CITY would not be willing to transfer ownership of, and responsibility for, CANINE to OFFICER.

6. This agreement and all of its provisions shall continue until the death of CANINE.

7. This agreement shall constitute the sole and only understanding between the parties hereto with respect to the subject matter herein, and no other warranties, representations, or terms of any kind exist except as set forth herein.

8. **IF OFFICER HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE OFFICER'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS**

AT 813-780-000, EXT. 3543 OR CITYCLERK@ZEPHYRHILLS.FL.US OR CITY OF ZEPHYRHILLS, 5335 EIGHTH STREET, ZEPHYRHILLS, FLORIDA 33542

Executed the day and date first above mentioned at Zephyrhills, Florida.

_____	_____
LANCE SMITH CITY COUNCIL PRESIDENT	OFFICER MORRIS SPARKMAN
_____	_____
Date	Date

City Council Meeting
February 26, 2024

Action Item

BUSINESS ITEMS/CITY ATTORNEY'S REPORT

3.1

Mayor's Youth Council Amendment
First Reading **ORDINANCE 1476-24 - "AN ORDINANCE BY THE CITY COUNCIL OF THE CITY OF ZEPHYRHILLS, FLORIDA AMENDING SECTION 30.140 OF THE CITY OF ZEPHYRHILLS CODE OF ORDINANCES, EXPANDING THE STUDENT SCHOOL GRADE LEVEL ELIGIBLE FOR APPOINTMENT TO THE MAYOR'S YOUTH COUNCIL; PROVIDING FOR APPLICABILITY, REPEALER, SEVERABILITY, INCLUSION IN THE CODE, AND PROVIDING AN EFFECTIVE DATE."**

Issue:
The Mayor and staff would like to increase the number of students that qualify to be a member of the Mayor's Youth Council.

Background:
Ordinance 1476-24 will allow for the expansion of qualifying students to participate in the Mayor's Youth Council.

The Ordinance allows:

- Charter school students;
- Middle school students;
- Students as young as sixth grade;
- Changes the length of terms;
- The mayor may call for the appointment of new members if the Youth Council fails to operate as a council for more than six months.

Attachment(s):
1. Ordinance No. 1476-24 - EDITED COPY Mayor's Youth Council Amendment

Fiscal Impact:
No fiscal impact

Staff Recommendation:
Staff recommends approval of Ordinance 1476-24

ORDINANCE 1476-24

AN ORDINANCE BY THE CITY COUNCIL OF THE CITY OF ZEPHYRHILLS, FLORIDA AMENDING SECTION 30.140 OF THE CITY OF ZEPHYRHILLS CODE OF ORDINANCES, EXPANDING THE STUDENT SCHOOL GRADE LEVEL ELIGIBLE FOR APPOINTMENT TO THE MAYOR'S YOUTH COUNCIL; PROVIDING FOR APPLICABILITY, REPEALER, SEVERABILITY, INCLUSION IN THE CODE, AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City of Zephyrhills ("City") has, by ordinance, established the Mayor's Youth Council to advise the City Council, amongst other things, on matters effecting youth within the City, to increase youth participation in local government, to promote civic education, and to prepare young people to be future civic leaders; and

WHEREAS, the City Council desires to amend the qualifications for individuals appointed to serve on the Mayor's Youth Council; and

WHEREAS, the City Council has conducted duly noticed public hearings as required by law, at which hearings all parties in interest and citizens were afforded notice and the opportunity to be heard; and

WHEREAS, the City Council desires to amend the qualifications and terms of service for individuals appointed to serve on the Mayor's Youth Council.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF HOMESTEAD, FLORIDA, AS FOLLOWS:[1]

Section 1. Recitals. The Whereas Clauses above are true and accurate and are incorporated by reference and made a part of this Ordinance.

Section 2. Authority. That this Ordinance is enacted pursuant to Chapter 166, Florida Statutes, and under the home rule powers of the City.

Section 3. Amendment to Code of Ordinances. That Section 30.140 of the City of Zephyrhills, Code of Ordinances is hereby modified as set forth herein below:

Sec. 30.140. – Creation.

> There is hereby created a Board to be known as the Mayor's Youth Council, which shall consist of seven members. The members will be Zephyrhills area residents who are actively enrolled in a public, charter, or private high school or middle school, or home schooled in grades ~~nine~~ six through 12. The members shall be appointed by the City Council and each member appointed shall serve a term of two years, except that of the seven members first appointed, three shall serve for a term of ~~seven months~~ three years, four shall serve for a term of ~~one year and seven months~~ two years, ending at the conclusion of the current school year that their term expires. The terms of members of the Mayor's Youth Council will remain staggered and will expire and be appointed in ~~June~~ August. If the Mayor's Youth Council fails to operate as a Council for more than Six (6) months, the Mayor can call for the appointment of all new members at any time and the new member's terms will be reduced by the time served from the date of appointment to the following August. The Mayor will attend meetings along with city staff~~,~~ and shall coordinate the youth council activities.

[1] Proposed additions to text of City Code of Ordinances are indicated by underline; proposed deletions from text of City Code of Ordinances are indicated by ~~strikethrough~~.

Section 5. Repealer. All ordinances and resolutions or parts thereof of the City in conflict with the provisions herein contained are, to the extent of such conflict, hereby superseded and repealed.

Section 6. Severability. It is declared the intent of the City Council of the City of Zephyrhills, Florida, that if any section, subsection, sentence, clause, or provision of this Ordinance shall be declared invalid, the remainder of this Ordinance shall be construed as not having contained said section, subsection, sentence, clause or provisions and shall not be affected by such holding.

Section 7. Inclusion in the Code. It is the intent of the City Council of the City of Zephyrhills, Florida that the provisions of this Ordinance shall become and be made a part of the City of Zephyrhills Code of Ordinances, and that the sections of this Ordinance may be renumbered or re-lettered and the word "ordinance" may be changed to "section," "article," "regulation," or such other appropriate word or phrase in order to accomplish such intentions.

Section 8. Effective Date. This Ordinance shall become effective upon passage on the second reading and signing by the Mayor.

The foregoing Ordinance No. 1476-24 was read and passed on the first reading in an open and regular meeting of the City Council of the City of Zephyrhills, Florida, on this 26th day of February, 2024.

Attest: _____ _____
Lori L. Hillman, City Clerk Lance A. Smith, Council President

The foregoing Ordinance No. 1476-24 was read and passed on the second reading, following a public hearing, in an open and regular meeting of the City Council of the City of Zephyrhills, Florida, on this 11th day of March, 2024.

Attest: _____ _____
Lori L. Hillman, City Clerk Lance A. Smith, Council President

The foregoing Ordinance No. 1476-24 was approved by me this 11th day of March, 2024.

_____
Melonie Bahr Monson, Mayor

Approved as to legal form and legal content

_____
Matthew E. Maggard, City Attorney

City Council Meeting
February 26, 2024

Action Item

BUSINESS ITEMS/CITY ATTORNEY'S REPORT 3.2

Indoor and Outdoor Storage Facilities Moratorium Extension
First Reading **ORDINANCE NO. 1477-24 - "AN ORDINANCE OF THE CITY OF ZEPHYRHILLS, FLORIDA, AMENDING ORDINANCE 1455-23, TO EXTEND THE TEMPORARY MORATORIUM ON RECEIVING AND PROCESSING PLANS AND PERMIT APPLICATIONS FOR RECREATIONAL VEHICLE STORAGE MATERIAL LAYDOWN AREAS AND INDOOR STORAGE FACILITIES; PROVIDING FOR CONFLICTS, SEVERABILITY, EXPIRATION AND AN EFFECTIVE DATE."**

Issue:
Extension of the Outdoor storage facilities moratorium for six months

Background:
Staff is continuing research / analysis on the previously approved storage moratorium and to prepare policy recommendations fort he City's Land Development Code.

Attachment(s):
1. 30386751v1 - Ordinance 1477-24 Storage Facilities Moratorium Extension

Fiscal Impact:
NA

Staff Recommendation:
Approval

ORDINANCE NO. 1477-24

AN ORDINANCE OF THE CITY OF ZEPHYRHILLS, FLORIDA, AMENDING ORDINANCE 1455-23, TO EXTEND THE TEMPORARY MORATORIUM ON RECEIVING AND PROCESSING PLANS AND PERMIT APPLICATIONS FOR RECREATIONAL VEHICLE STORAGE MATERIAL LAYDOWN AREAS AND INDOOR STORAGE FACILITIES; PROVIDING FOR CONFLICTS, SEVERABILITY, EXPIRATION AND AN EFFECTIVE DATE.

WHEREAS, as provided in section 2(b), Article VIII of the Constitution of the State of Florida, and section 166.021(1), Florida Statutes, the City of Zephyrhills, Florida (the "City"), a municipal corporation, enjoys all governmental, corporate, and proprietary powers necessary to conduct municipal government, perform municipal functions, and render municipal services, and may exercise any power for municipal purposes, except as expressly prohibited by law; and

WHEREAS, as provided in section 166.021(3), Florida Statutes, the governing body of each municipality in the state has the power to enact legislation concerning any subject matter upon which the state legislature may act, except when expressly prohibited by law; and

WHEREAS, the City of Zephyrhills passed Ordinance 1455-23 on February 27, 2023 to establish a temporary moratorium on receiving and processing plans and permit applications for: Recreational Vehicle Storage, Material Laydown Areas, and Indoor Storage Facilities with an expiration date of February 27, 2024; and

WHEREAS, the City of Zephyrhills staff is still reviewing and preparing standards to be implemented for storage facilities as described herein and is requested additional time, not to exceed six (6) months from the effective date of this Ordinance.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF ZEPHYRHILLS, FLORIDA, AS FOLLOWS:

SECTION 1. FINDINGS OF FACT. The above "Whereas" clauses are deemed findings of fact and are adopted herein.

SECTION 2. EXPIRATION. The expiration date of Ordinance 1455-23 shall be the earlier of six (6) months after the adoption of this Ordinance, or the final adoption of an ordinance regulating Recreational Vehicle Storage, Material Laydown Areas, and Indoor Storage Facilities.

SECTION 3. CONFLICTS. All ordinances or parts of ordinances in conflict with any of the provisions of this Ordinance are hereby repealed to the extent of such conflict.

SECTION 4. SEVERABILITY. If any section, subsection, sentence, clause, phrase, word or provision of this Ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, whether for substantive, procedural, or any other reason, such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions of this Ordinance.

SECTION 5. EFFECTIVE DATE. This Ordinance shall become effective pursuant to the Zephyrhills Charter.

The foregoing Ordinance No. 1477-24 was read and passed on the first reading in an open and regular meeting of the City Council of the City of Zephyrhills, Florida, on this 26th day of February, 2024.

Attest: _____ _____

Lori L. Hillman, City Clerk Lance A. Smith, Council President

The foregoing Ordinance No. 1477-24 was read and passed on the second reading, following a public hearing, in an open and regular meeting of the City Council of the City of Zephyrhills, Florida, on this 11th day of March, 2024.

Attest: _____ _____
Lori L. Hillman, City Clerk Lance A. Smith, Council President

The foregoing Ordinance No. 1477-24 was approved by me this 11th day of March, 2024.

_____
Melonie Bahr Monson, Mayor

Approved as to legal form and legal content

_____
Matthew E. Maggard, City Attorney

City Council Meeting
February 26, 2024

Action Item

BUSINESS ITEMS/CITY ATTORNEY'S REPORT 3.3

Oakside Cemetery Amendment
First Reading **ORDINANCE 1478-24 - "AN ORDINANCE BY THE CITY COUNCIL OF THE CITY OF ZEPHYRHILLS, FLORIDA AMENDING SECTION 94.06. – INSTALLATION, MARKERS, MONUMENTS OF THE CITY OF ZEPHYRHILLS CODE OF ORDINANCES, AMENDING THE MARKERS REQUIREMENTS IN BLOCKS ONE THROUGH 8 (THE OLD SECTION) OF THE CITY OF ZEPHYRHILLS OAKSIDE CEMETERY; PROVIDING FOR APPLICABILITY, REPEALER, SEVERABILITY, INCLUSION IN THE CODE, AND PROVIDING AN EFFECTIVE DATE. "**

Issue:
The City has received requests over the years to allow vertical headstones at Oakside Cemetery. Currently, vertical headstones are not permitted in the cemetery, although there are existing headstones in Blocks 1 through 8, "The Old Section."

Staff would like to amend the ordinance to allow vertical headstones within only Blocks 1 through 8. All other blocks/sections will still prohibit vertical headstones.

Background:

Attachment(s):
1. Ordinance No. 1478-24 - Oakside Cemetery Amendment

Fiscal Impact:
No fiscal impact

Staff Recommendation:
Staff recommends approval of the amendment to Ordinance 1478-24.

ORDINANCE 1478-24

AN ORDINANCE BY THE CITY COUNCIL OF THE CITY OF ZEPHYRHILLS, FLORIDA AMENDING SECTION 94.06. – INSTALLATION, MARKERS, MONUMENTS OF THE CITY OF ZEPHYRHILLS CODE OF ORDINANCES, AMENDING THE MARKERS REQUIREMENTS IN BLOCKS ONE THROUGH 8 (THE OLD SECTION) OF THE CITY OF ZEPHYRHILLS OAKSIDE CEMETERY; PROVIDING FOR APPLICABILITY, REPEALER, SEVERABILITY, INCLUSION IN THE CODE, AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City of Zephyrhills owns and operates the Oakside Cemetery and has established rules and regulations for the operation of same; and

WHEREAS, City Council has determined that it is in the best interest of the citizens of the City of Zephyrhills to amend the rules and regulations for the operation of the City's cemetery from time to time;

WHEREAS, the City Council has conducted duly noticed public hearings as required by law, at which hearings all parties in interest and citizens were afforded notice and the opportunity to be heard; and

WHEREAS, the City Council desires to amend the rules and regulations that apply to the type of markers can be used in Blocks one through 8 ("The Old Section") of the Oakside Cemetery.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF HOMESTEAD, FLORIDA, AS FOLLOWS:[1]

Section 1. Recitals. The Whereas Clauses above are true and accurate and are incorporated by reference and made a part of this Ordinance.

Section 2. Authority. That this Ordinance is enacted pursuant to Chapter 166, Florida Statutes, and under the home rule powers of the City.

Section 3. Amendment to Code of Ordinances. That Section 94.06(e) of the City of Zephyrhills, Code of Ordinances is hereby modified as set forth herein below:

Sec. 94.06. – Installation, markers, monuments..

(E) With the exception of ~~existing~~ markers in blocks one through eight, all markers must be flush using ground variety. These markers shall be installed at ground level and may contain inverted type vases which can be inverted when not in use.

Section 5. Repealer. All ordinances and resolutions or parts thereof of the City in conflict with the provisions herein contained are, to the extent of such conflict, hereby superseded and repealed.

Section 6. Severability. It is declared to be the intent of the City Council of the City of Zephyrhills, Florida, that if any section, subsection, sentence, clause, or provision of this ordinance is held invalid, the remainder of the ordinance shall be construed as not having continued the said section, subsection, sentence, clause, or provision and shall not be affected by such holding.

Section 7. Inclusion in the Code. It is the intent of the City Council of the City of Zephyrhills, Florida that the provisions of this Ordinance shall become and be made a part of the City of Zephyrhills Code of Ordinances, and that the sections of this Ordinance may be renumbered

[1] Proposed additions to text of City Code of Ordinances are indicated by underline; proposed deletions from text of City Code of Ordinances are indicated by ~~strikethrough~~.

or re-lettered and the word "ordinance" may be changed to "section," "article," "regulation," or such other appropriate word or phrase in order to accomplish such intentions.

Section 8. Effective Date. This Ordinance shall become effective upon passage on the second reading and signing by the Mayor.

The foregoing Ordinance No. 1478-24 was read and passed on the first reading in an open and regular meeting of the City Council of the City of Zephyrhills, Florida, on this 26th day of February, 2024.

Attest: _____ _____
Lori L. Hillman, City Clerk Lance A. Smith, Council President

The foregoing Ordinance No. 1478-24 was read and passed on the second reading, following a public hearing, in an open and regular meeting of the City Council of the City of Zephyrhills, Florida, on this 11th day of March, 2024.

Attest: _____ _____
Lori L. Hillman, City Clerk Lance A. Smith, Council President

The foregoing Ordinance No. 1478-24 was approved by me this 11th day of March, 2024.

_____
Melonie Bahr Monson, Mayor

Approved as to legal form and legal content

_____
Matthew E. Maggard, City Attorney